THE UNIVERSITY *of* EDINBURGH

THE UNIVERSITY *of* EDINBURGH

Persecutory delusions and the internalising attributional bias for positive events: a systematic review and meta-analysis

and

Training forensic mental health nurses in Cognitive Analytic Therapy (CAT) principles: a qualitative exploration of the impact on complex case conceptualisation and implications for practice.

David Barker

Doctorate in Clinical Psychology

October 2018

Submitted in part fulfilment of the degree of Doctorate in Clinical Psychology at the University of Edinburgh

Table of Contents

DClinPsychol Declaration of Own Work

Name: David Barker

Title of Work:

Persecutory delusions and the internalising attributional bias for positive events: a systematic review and meta-analysis

and

Training forensic mental health nurses in Cognitive Analytic Therapy (CAT) principles: a qualitative exploration of the impact on complex case conceptualisation and implications for practice.

I confirm that this work is my own except where indicated, and that I have:

- Read and understood the Plagiarism Rules and Regulations
- Composed and undertaken the work myself

- Clearly referenced/listed all sources as appropriate
- Referenced and put in inverted commas any quoted text of more than three words (from books, web, etc.)
- Given the sources of all pictures, data etc. that are not my own
- Not made undue use of essay(s) of any other student(s), either past or present (or where used, this has been referenced appropriately)

- Not sought or used the help of any external professional agencies for the work (or where used, this has been referenced appropriately)

- Not submitted the work for any other degree or professional qualification except as specified
- Acknowledged in appropriate places any help that I have received from others (e.g. fellow students, technicians, statisticians, external sources)
- Complied with other plagiarism criteria specified in the Programme Handbook
- I understand that any false claim for this work will be penalised in accordance with the University regulations

- Received ethical approval from the School of Health in Social Science, University of Edinburgh
  OR
- Received ethical approval from an approved external body and registered this application and confirmation of approval with the School of Health in Social Science's Ethical Committee

Signature: **Date**: **15th October 2018**

Acknowledgements

Firstly, I would like to thank my academic supervisors Dr. Ethel Quayle and Dr. Emily Newman for all of their advice, expertise, and encouragement throughout the research process. Over the course of my clinical training, their friendly and reassuring approach was always a comfort.

I would also like to sincerely thank Dr. Louise Tansey for all of her support, encouragement, and advice. Without her input, the experimental project would not have been possible.

The meta-analysis was enhanced by the expertise of Dr. Paul Hutton for which I am thankful. I would also like to express my gratitude to Dr. Philip Murphy for taking time out his own busy life to provide input and expertise, far beyond what one would have expected.

A special thank you to Laura, and all of my friends and family, for being as supportive as ever, and putting up with me over the duration of training.

Lastly, I am forever grateful to the participants who shared their experiences with me.

Portfolio thesis abstract

Purpose: A systematic review and meta-analysis tested the 'paranoia as a defence' model's original prediction that those experiencing persecutory delusions would take excessive credit for positive events as part of an attributional style that protects them from low self-esteem. The empirical project explored forensic mental health nurses' experiences of a Cognitive Analytic Therapy (CAT) training programme with an emphasis on complex case conceptualisation and implications for clinical practice.

Methods: In relation to the systematic review and meta-analysis, those experiencing persecutory delusions were compared to those with non-paranoid psychosis, depression, and healthy controls, in terms of the magnitude of internalising attributional bias (IAB) for positive events. Correlation analysis also examined the association between magnitude of IAB and paranoia severity. In the empirical study, 10 forensic mental health nurses took part in semi-structured interviews to qualitatively explore their experiences and applications of CAT training.

Results: Consistent with the model, an internalising attributional bias was present for those experiencing paranoid delusions when compared to individuals with depression. Contrary to the model, there were no differences between the other control groups and there was no significant correlation between IAB and paranoia severity. Internal attributions for positive events appear to be associated with depression, rather than paranoia. Analysis of the empirical data provided a rich account of nurses' experiences of the CAT training and how this helped them to conceptualise complex patients and promoted more positive ways of working.

Conclusions: The findings from the systematic review and meta-analysis do not support the original model, but are consistent with the modified 'paranoia as a defence' model of persecutory delusions. Other cognitive models also help explain paranoia suggesting that refining the existing models further could be useful. The empirical findings suggest that CAT could be a valuable model of psychologically informed practice for nurses working in a forensic setting. Specifically, training appeared to help nurses develop a better understanding of their patients, greater self-reflection skills, and improved clinical care approaches.

Chapter 1: Systematic review and meta-analysis

Persecutory delusions and the internalising attributional bias for positive events: a systematic review and meta-analysis

David Barker[1,3]*, Paul Hutton[2], Emily Newman[1], Louise Tansey[3], Ethel Quayle[1], Philip Murphy[2,4]

[1]Department of Clinical Psychology
School of Health in Social Science
University of Edinburgh

[2] School of Health & Social Care
Edinburgh Napier University

[3]The Orchard Clinic, Royal Edinburgh Hospital
NHS Lothian

[4]Greater Manchester Mental Health
NHS Foundation Trust

*Corresponding author: David Barker, david.barker10@nhs.net

Written for publication in *Clinical Psychology Review* - **Word count: 8,623**

Abstract

Purpose: To test the 'paranoia as a defence' model's original prediction that those experiencing persecutory delusions would take excessive credit for positive events as part of an attributional style that protects them from low self-esteem.
Method: 25 studies were identified to conduct a systematic review and meta-analysis of the differences in internal attributions for positive events between individuals with persecutory delusions, non-paranoid psychosis, depression, and healthy controls.
Results: Consistent with the model, an internalising attributional bias was present for those experiencing paranoid delusions when compared to individuals with depression. Inconsistent with the model, there were no differences between the other control groups and there was no significant correlation between internalising attributional bias for positive events and paranoia severity. Internal attributions for positive events appear to be associated with depression, rather than paranoia.
Conclusions: The findings do not support the original model, but are consistent with the modified 'paranoia as a defence' model. Other cognitive models also help explain paranoia suggesting that refining the existing models further could be useful.

Introduction

Paranoid or persecutory delusions have been defined as "unfounded ideas that personal harm is going to occur, and that the persecutor has this deliberate intention" (Freeman, 2016, p. 686). Such delusions are a common feature of psychotic spectrum disorders, with research suggesting that they are the most prevalent delusional sub-type amongst first episode psychosis cases (Coid et al., 2013; Paolini, Moretti, & Compton, 2016). Moreover, it has been suggested that persecutory delusions can predict suicide (Hor & Taylor, 2010), violent behaviour (Keers, Ullrich, DeStavola, & Coid, 2014), and treatment-resistance in schizophrenia (Wimberley et al., 2016).

A number of cognitive models have been proposed in an attempt to foster a greater psychological understanding of persecutory delusions. One of the most researched models is the 'paranoia as a defence' model (Bentall, Kinderman, & Kaney, 1994). In their original model, Bentall et al. (1994) proposed that those experiencing persecutory delusions engage in an attributional style that serves to protect the individual from unconscious low self-esteem. It was demonstrated that those with persecutory delusions take excessive responsibility for positive events and externalise blame for negative events, a reverse of the pattern observed in depressed individuals (Kaney & Bentall, 1989; Candido & Romney, 1990). Bentall and colleagues proposed that this attributional process, an exaggerated form of the self-serving bias witnessed in non-clinical populations (Campbell & Sedikides, 1999), serves to protect the individual from their low unconscious (implicit) self-esteem reaching awareness, whilst maintaining an inflated level of explicit (conscious) self-esteem (Bentall et al. 1994).

An implication of this model is that those with persecutory delusions are more likely to take excessive responsibility for positive events as part of an exaggerated self-serving bias (Bentall et al., 1994). Whilst externalising blame for negative events is deemed to protect the individual from unconscious low self-esteem reaching consciousness, the internalising of responsibility (taking excessive credit) for positive events is deemed to serve an analogous defensive function. Indeed, many studies exploring attributional biases in paranoid psychosis samples have utilised attribution

questionnaires such as the Attributional Style Questionnaire (ASQ; Perterson et al., 1982) and the Internal, Personal, and Situational Attributions Questionnaire (IPSAQ; Kinderman and Bentall, 1996). Both of these measures permit the user to derive composite variables to report a participant's attributional style for negative and positive events as one overall score. The 'self-serving bias' (ASQ) and 'externalising bias' (IPSAQ) composite scores are calculated by subtracting the number of internal attributions made for negative events from the number of internal attributions made for positive events (i.e. self-serving bias). In utilising calculations between positive event-internality and attributional style for negative events, authors have placed credence on the notion that an internalising attribution bias for positive events exists in those with persecutory delusions.

Despite the paranoia as a defence model offering a comprehensive theoretical basis for the role of persecutory delusions, major systematic reviews by Garety and Freeman (1999; 2013) reported that the presence of an internal attributional bias for positive events was not supported, however, evidence of an externalising bias for negative events was equally balanced. Moreover, three systematic reviews have suggested that explicit self-esteem in paranoid patients is relatively low (Garety & Freeman, 2013; Kesting & Lincoln, 2013; Tiernan, Tracey, & Shannon, 2014) and it has been argued that this does not conform with a defence account of persecutory delusions. In accounting for these observations, the latest revision of the model, the attribution-self-representation cycle (ASRC; Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001), suggests that self-esteem and attributional processes are influenced by each other cyclically as an individual attempts to understand events in their life. They propose that self-esteem instability is caused by a combination of low implicit self-esteem and an externalising attributional bias. Thus, persecutory delusions do not completely defend against low self-esteem reaching awareness and self-esteem instability can lead to increased persecutory delusions.

The most notable theoretical offering to counter the ASRC model is that of Freeman, Garety, Kuipers, Fowler, and Bebbington (2002) who suggest in their cognitive model that persecutory delusions are a reflection of internal emotional processes associated

with an individual's pre-existing beliefs, personality, environment, and psychotic phenomena. They argue that persecutory delusions are not a product of a self-defensive process; instead, they suggest that persecutory delusions are associated with mood and are perceived by the individual as evidence of their own threat-beliefs. In support of the notion that paranoia is a reflection of internal emotional processes, a study by Freeman et al. (2012) found that anxiety, worry, depression, and insomnia, were all significant predictors of new paranoid ideas and the maintenance of existing paranoid ideation. In light of research supporting the presence of an externalising bias in patients with persecutory delusions, it is of importance to note that Freeman and colleagues accept the possible presence of an externalising bias in these patients, but dispute that it serves any self-defensive function. It is proposed that any attributional bias is a reflection of the low self-esteem, internal emotional processes, and threat-beliefs, associated with paranoid psychosis pathology (Freeman et al., 2002).

In a recent comprehensive meta-analysis (Murphy, Bentall, Freeman, O'Rourke, & Hutton, in preparation), key components of the ASRC model were explored. In their review, Murphy et al. (in preparation) reported an exaggerated externalising bias for negative events in those with persecutory delusions when compared to those with non-paranoid psychosis, depression, and healthy controls. Furthermore, this externalising bias was positively correlated to the magnitude of paranoia amongst those with psychosis. Moreover, they found a greater discrepancy between implicit and explicit self-esteem in those with persecutory delusions when compared to those with depression, and a positive correlation between self-esteem instability and paranoia severity. These findings appear to support the updated 'paranoia as a defence' model (Bentall et al., 2001).

As predicted by Freeman et al. (2002), and contrary to the original 'paranoia as a defence' account, Murphy et al. (in preparation) found that those with persecutory delusions had low levels of explicit self-esteem when compared to healthy controls. Furthermore, they reported that explicit self-esteem was negatively correlated with magnitude of paranoia and there were no differences in implicit-explicit self-esteem discrepancy between those with paranoid delusions and healthy controls. Though few

studies were available for comparison, analysis of 4 studies showed that there was no differences in implicit or explicit self-esteem between those with persecutory delusions and those with non-paranoid psychosis. These findings offered partial support for an alternative cognitive model of persecutory delusions (Freeman et al., 2002). They concluded that both models may be required to fully understand the nature of persecutory delusions. Whilst Murphy et al. (in preparation) provided valuable analysis of the 'paranoia as a defence' model, they did not explore the internalising of positive events as a defensive function of paranoia. They highlighted in their review the need to explore the internalising of positive events as a separate construct as it was deemed to be an important facet of the exaggerated self-serving bias purported to exist in paranoid patients in the original model (Bentall et al., 1994). Moreover, previous studies have suggested the presence of an exaggerated internalising attributional bias for positive events in those with persecutory delusions (Aakre, Seghers, St-Hilaire, & Docherty, 2009; Candido & Romney, 1990; Kaney & Bentall, 1989; Melo & Bentall, 2013).

A meta-analysis exploring internal attributions for positive events would be an important consideration in the evaluation of the 'paranoia as a defence' model due to three primary reasons: (1) Previous studies have revealed inconsistent findings regarding an internal attributional bias for positive events in paranoid samples compared with healthy controls; (2) Systematic reviews conducted (Garety & Freeman, 1999; 2013) have consisted of small studies and no meta-analytic findings have been reported that would maximise power and counter sample size limitations; (3) 'self-serving bias' and 'externalising bias' scores in the attributional bias literature are common composite scores which incorporate internal attributions for positive events as part of their calculation. It can, therefore, be assumed that a level of importance is placed on internal attributions for positive events when interpreting attributional bias findings in those with persecutory delusions.

The aim of this study was to produce meta-analytical findings pertaining to the internal attribution bias for positive events in patients with persecutory delusions. It was predicted that individuals with persecutory delusions would demonstrate a greater

internal attributional bias for positive events compared with healthy controls, individuals with non-paranoid psychosis, and individuals with depression. Furthermore, a positive correlation was expected between the magnitude of internalising attributional bias and paranoia severity in patients with psychosis. Finally, two pre-specified moderator analyses were explored to examine the effect that matching of sample demographics and depression had on the overall estimates of effect.

Methods

This study was conducted in adherence to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA; Moher et al., 2009).

Review Protocol Registration

A protocol for this review was published in advance with the PROSPERO International Prospective Register of Systematic Reviews (registration number: CRD42017078038) (see supplement). A search was also conducted for other published or registered reviews to prevent duplication.

Search Strategy

A comprehensive systematic review of the literature was conducted following consultation with a research librarian and a member of the research team (PM). A search of electronic databases (MEDLINE, PsycINFO, EMBASE, and Web of Science) from 1970, until 5th January 2018, was undertaken, using the following search terms: (attribution bias* or attributional bias* or externalising bias* or externalizing bias* or internalising bias* or internalizing bias* or personalising bias* or personalizing bias* or self-serving bias*) AND (psychosis or psychotic or schizo* or delusion* or paranoi* or persecut*). The reference lists of two relevant and comprehensive reviews (Garety and Freeman, 2013; Murphy et al., in preparation) were then collated and searched for any additional references. The reference lists of all full text articles were subsequently searched to identify any literature missed during the initial searches. When it was thought that relevant data had been collected but not reported, corresponding authors of the appropriate studies were contacted in an attempt to obtain unpublished data. Finally, all corresponding authors of included articles were contacted to seek out any further unpublished articles.

Selection of Studies

Studies were selected for the comparative analyses if they measured the internalising attributional bias for positive events in (1) individuals diagnosed with a psychotic illness where at least 50% experienced current paranoid delusions and (2) healthy controls or individuals with depression. Studies were also included in the comparative group analyses if they compared people with psychosis with current paranoid delusions to individuals with non-paranoid psychosis, providing that less than 50% of the non-paranoid sample experienced current persecutory delusions (and, if specified, grandiose delusions). Where studies did not report a control group, the data was included in the correlation analysis if at least 50% of the sample had a diagnosis of psychosis and correlation data was reported between measures of internalising attributional bias and paranoid ideation. Studies comparing people with current paranoid delusions to individuals diagnosed with non-paranoid psychosis (irrelevant of the presence of grandiose delusions in the non-paranoid group) were included in the correlation analyses. Cross-sectional data, including baseline data from longitudinal studies, experimental manipulation studies and trials of interventions, were eligible for inclusion in the different analyses. Grey literature was not included in the searches and all included studies consisted of adult samples whereby participants were at least 18 years old.

Studies were excluded where at least 50% of the sample had intellectual disability, bipolar disorder, a primary diagnosis of substance-induced psychosis, or psychosis that was secondary to an organic illness. When samples overlapped by at least 25%, the study that reported on the largest number of participants was used. Only studies reported in English were considered. Selection of studies was carried out by DB using the inclusion/exclusion criteria. Where there was ambiguity regarding the inclusion status of a study (E.g. due to missing data or unreported data), this was decided in consultation with PM.

Primary Outcome and Data Extraction

The primary outcome measure was the degree to which positive events were attributed to oneself (i.e., internalising attributional bias). Data from the Internal, Personal, and Situational Attributions Questionnaire (IPSAQ; Kinderman and Bentall, 1996) were prioritised over data from other measures, and data from the Attributional Style Questionnaire (ASQ; Peterson et al., 1982) were prioritised over data from measures other than the IPSAQ, if a study contained more than one attributional measure. Finally, participants' self-ratings, as opposed to independent judges' ratings, regarding the extent to which participants' attributional statements represented an internalising attributional bias, were given priority.

DB extracted the data utilising a standardised spreadsheet. The data were also independently extracted by PM. The two sets of independently extracted data were then compared and any discrepancies were resolved by consensus. For group comparison analyses, mean outcome scores and their associated standard deviations (SDs) were extracted. For one study, mean scores were obtained from a graph utilising Digitizelt. The missing SDs were then estimated from the mean SD of the other included studies (Furukawa, Barbui, Cipriani, Brambilla, & Watanabe, 2006). For the within-group analysis, correlation coefficients were extracted or derived from group differences between psychotic samples with and without current persecutory delusions using an online effect size calculator (Wilson, 2018).

Meta-Analytic Calculations

RevMan5 (Cochrane Group, 2018) and OpenMEE (Wallace et al., 2017) were utilised to conduct the group comparison meta-analyses and the correlational meta-analysis, respectively. For the group comparison meta-analyses, Hedges' g standardised mean difference (SMD) and 95% confidence intervals (CIs) were calculated. Where a study reported two or more similar groups, these were combined into one in adherence with principles documented in the Cochrane Handbook (Higgins & Green, 2011). In accordance with Cohen's (1988) conventions, effect sizes (reported as Hedges g) of 0.2, 0.5, and 0.8 represented small, moderate, and large effect sizes respectively.

For the correlational meta-analysis, all of the Pearson's correlations were converted into Fisher's Z and 95% CIs. To allow for interpretation using Cohen's (1988) conventions, these meta-analytical estimates were back-transformed into Pearson's correlations. Correlations (reported as Pearson's r) of 0.1, 0.3, and 0.5 represented small, moderate, and large correlations respectively.

In light of expected heterogeneity in effect size magnitude, DerSimonian and Laird method (1986) random-effects meta-analyses were selected for all outcomes. Where there was less than moderate heterogeneity (I^2 <40%), a sensitivity analysis using a fixed-effect meta-analysis was explored but reported only if substantively different. A sensitivity analysis was also conducted to explore whether prioritising independent judges' ratings instead of participants' self-ratings (regarding the extent to which participants' attributional statements represented an internalising attributional bias) affected the meta-analytical estimates. In addition, publication bias was examined through the DOI plot and the LFK index in MetaXL for outcomes with at least 10 studies (Higgins and Green, 2011); this is an advantageous method over the traditional funnel plot due to increased sensitivity. In cases where publication bias was indicated (i.e., LFK index >2), we planned to utilise the 'trim and fill' method (Duval & Tweedie, 2000) to make the appropriate adjustments, though this was not necessary.

Moderator Analyses

Two pre-specified moderators of effect size were examined: (1) group differences in depression, and (2) matching of groups based on demographic information. Random-effects meta-regression was used to test the moderators using OpenMEE (Wallace et al., 2016), but only when at least 10 studies provided useable data in the meta-analysis (Higgins & Green, 2011). There was insufficient data to examine two of the moderators: early vs chronic psychosis and outcome assessor blinding.

Study Quality and Risk of Bias

All of the studies were assessed for methodological quality using an adapted version of the Agency for Healthcare Research and Quality assessment tool (AHRQ; Williams,

Plassman, Burke, Holsinger, & Benjamin, 2010). This tool benefits from transparency and consistency when considering the scope and limitations of studies accounting for things such sample size, reporting of findings, and selection and recruitment procedures. We followed the adaptations made by Murphy et al. (in preparation) (see supplement).

An adapted version of The Grading of Recommendations Assessment, Development and Evaluation (GRADE; Guyatt et al., 2008) approach was utilised to assess the quality of meta-analytic outcomes. GRADE was designed for use with research trials rather than observational studies, and was therefore adapted. Publication bias, quality of methodology, inconsistency, and imprecision were all encapsulated by the overall GRADE rating defined as 'high', 'moderate', 'low', or 'very low' quality. We followed the adaptations made by Murphy et al. (in preparation) (see supplement).

Most of the studies in this review were also included in the recent review by Murphy et al. (in preparation), which explored different domains of the paranoia as defence model including the externalising attributional bias. For these overlapping studies, the same AHRQ ratings were used (except for the rating regarding the measure of the internalising attributional bias) to ensure consistency; these ratings had been made by PM and cross-checked by PH. For the studies that were not included in the previous review, the AHRQ ratings were made by DB and were cross-checked by PM. Moreover, all of the GRADE ratings in this review were made by DB cross-checked by PM.

Results

Study Selection

We identified 777 articles through the initial electronic database search, a manual reference search of two comprehensive reviews (Garety and Freeman, 2013; Murphy et al., in preparation), and other sources. 427 articles remained after deduplication, and 63 remained after titles and abstracts were screened. All 62 full texts were reviewed and 37 studies were excluded for failing to meet the inclusion criteria; the remaining 25 were included in the review (Fig. 1, Table 1). Excluded studies, reasons for exclusion, and a detailed description of included studies are detailed in the supplement. Of the 25 studies included in the review, 7 contained additional data that was not reported in the original article. The unpublished data was provided by the corresponding author of the respective article upon request (Berry, Bucci, Kinderman, Emsley, & Corcoran, 2015; Davidson, Lesser, Parente, & Fiszdon, 2017; Fornells-Ambrojo & Garety, 2009; Lincoln, Mehl, Exner, & Lindenmeyer, 2010; Menon, Addington, & Remington, 2013; Randjbar, Veckenstedt, Vitzthum, Hottenrott, & Moritz, 2011; Sanford & Woodward, 2017). Year of publication ranged from 1989 to 2017 and almost half of studies took place in the United Kingdom (k=12). The remaining studies were conducted in Germany (k=5), Canada (k=3), the United States of America (k=3), Australia (k=1), and Spain (k=1).

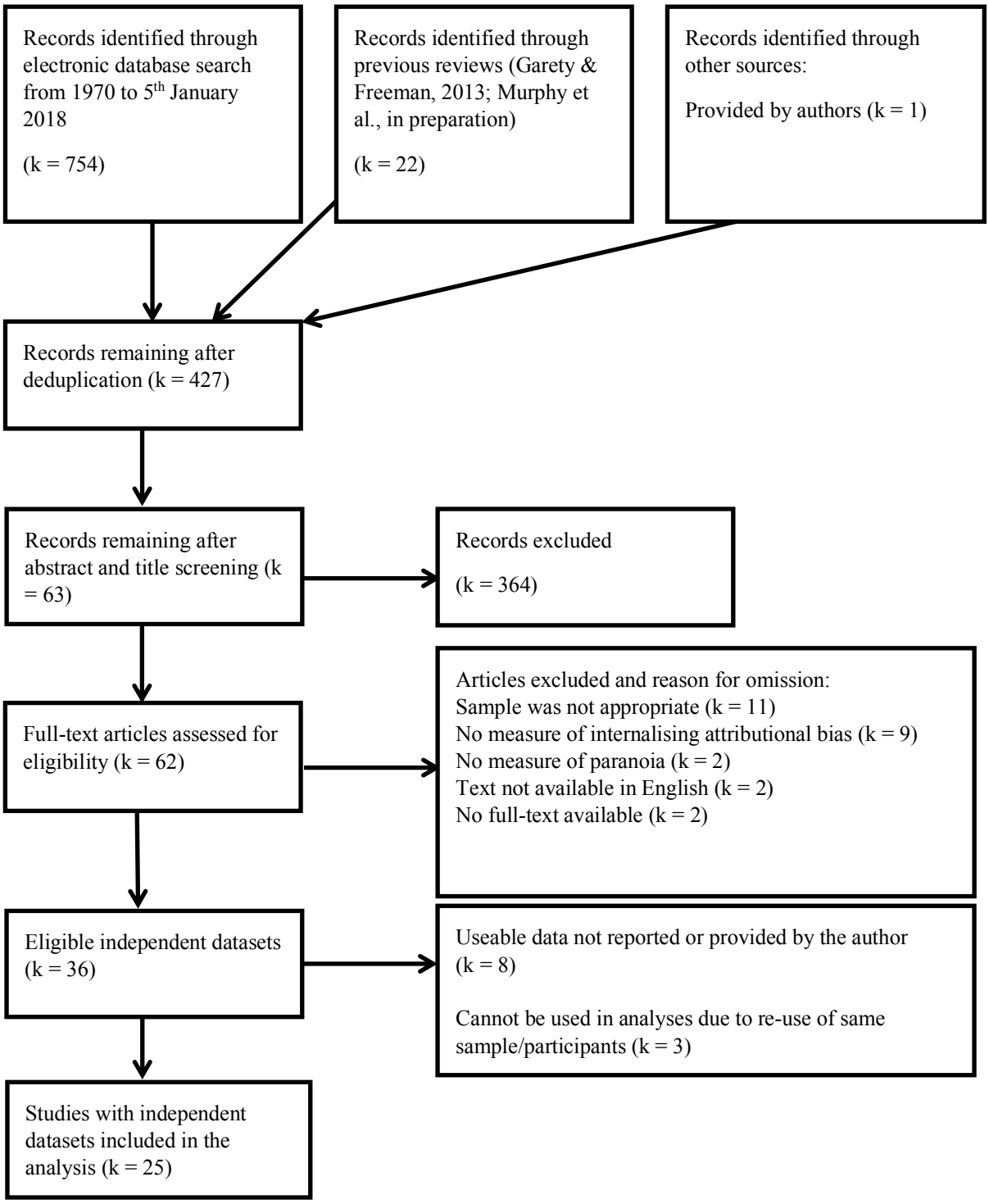


Fig 1. PRISMA study selection procedure

Table 1. Included studies

Study (Country)	Included participant groups (N)	Measure of IAB
Aakre, 2009 (USA)	PDs (18), Non-paranoid psychosis (47), Healthy controls (29)	LACS
Berry, 2015 [a] (UK)	PDs (22), Healthy controls (25)	IPSAQ
Candido, 1990 (CANADA)	PDs (15), Depression (15)	ASQ
Davidson, 2017 [a] (USA)	Psychosis (51)	IPSAQ
Diez-Alegria, 2006 (SPAIN)	PDs (40), Non-paranoid psychosis (25), Depression (35), Healthy controls (36)	IPSAQ
Fear, 1996 (UK)	PDs (20), Healthy controls (20)	ASQ
Fornells-Ambrojo, 2009 [a] (UK)	PDs (20), Depression (19), Healthy controls (32)	ARAT
Jolley, 2006 (UK)	PDs (14), Non-paranoid psychosis (34)	ASQ
Kaney, 1989 (UK)	PDs (17), Depression (16), Healthy controls (17)	ASQ
Kinderman, 1997 (UK)	PDs (20), Depression (20), Healthy controls (20)	IPSAQ
Lee, 2004 (UK)	PDs (12), Healthy controls (12)	CAVE
Lincoln, 2010 [a] (GERMANY)	PDs (25), Non-paranoid psychosis (25), Healthy controls (70)	IPSAQ
Lyon, 1994 (UK)	PDs (14), Depression (14), Healthy controls (14)	ASQPF
Martin, 2002 (USA)	PDs (15), Non-paranoid psychosis (15), Healthy controls (16)	IPSAQ
McKay, 2005	PDs (13), Non-paranoid psychosis (11), Healthy controls (19)	IPSAQ

(AUSTRALIA)		
Mehl, 2010 (GERMANY)	PDs (20), Non-paranoid psychosis (16), Healthy controls (21)	IPSAQ
Mehl, 2014 (GERMANY)	PDs (142), Healthy controls (51)	IPSAQ-R
Melo, 2006 (UK)	PDs (35), Healthy controls (20)	ASQ
Melo, 2013 (UK)	PDs (41), Healthy controls (25)	SDEI
Menon, 2013 [a] (CANADA)	Psychosis (14)	IPSAQ
Moritz, 2007 (GERMANY)	PDs (35), Depression (18), Healthy controls (28)	ASQ-B
Randall, 2003 [a] (UK)	PDs (18), Non-paranoid psychosis (14), Healthy controls (18)	IPSAQ
Randjbar, 2011 (GERMANY)	PDs (10), Non-paranoid psychosis (19), Healthy controls (33)	IPSAQ
Sanford, 2017 [a] (CANADA)	PDs (10), Non-paranoid psychosis (31), Healthy controls (58)	ASB
Sharp, 1997 (UK)	PDs (19), Non-paranoid psychosis (12), Healthy controls (24)	ASQ

Terms: IAB = Internalising Attributional Bias (for positive events); PDs = Persecutory Delusions.

Attributional style measures: ARAT = Attributional style Achievement and Relationships Attributions Task; ASB = Attributional Style Bade Task; ASQ = Attributional Style Questionnaire; ASQ-B = ASQ modified by Brunstein; ASQpf = ASQ parallel form; CAVE = Content Analysis of Verbatim Explanations; IPSAQ = Internal, Personal, and Situational Attributions Questionnaire; IPSAQ-R = IPSAQ-Revised; LACS = Leeds Attributional Coding System; SDEI = Significant Daily Events Interview.

[a]Additional data was provided by the authors.

Risk of Bias and Quality Ratings

Where the AHRQ ratings concerning the methodological quality of the included studies are illustrated in Table 2, GRADE ratings pertaining to the quality of each meta-analytic outcome are located in the second from right column in Table 3.

Though convenience samples were largely used, many of the studies recruited participants in a relatively unbiased way. Moreover, studies largely provided adequate descriptions of the sample, and used valid and reliable measures of diagnostic status, paranoia severity and the internalising attributional bias.

In many of the studies, participants were only partly matched or unmatched in terms of key demographic variables (e.g. age, education, gender). More pervasive methodological problems included a lack of pre-specified power calculations and failure to blind researchers to diagnostic status.

Table 2. An overview of the methodological quality of included studies (AHRQ; adapted by Murphy et al., in preparation)

Author/study	Unbiased selection of cohort?	Selection minimizes baseline differences in prognostic factors?	Sample size calculation?	Adequate description of the cohort?	Validated method for ascer-taining psychotic disorder?	Validated method for ascertaining persecutory delusions or measuring paranoia/ persecutory ideation?	Validated method for ascertaining absence of diagnosis?	Validated method for ascer-taining depression?	Validated method of measuring intern-alising attribution bias?	Outcome assess-ments blind to clinical status?	Missing data low or adequately handled?
Aakre, 2009	Yes	Partial	No	Yes	Yes	Yes	Yes	—	Yes	Yes	Yes
Berry, 2015	Yes	Partial	No	Yes	Yes	Yes	Unclear	—	Yes	No	Yes
Candido, 1990	Yes	No	No	Partial	Partial	Yes	—	Yes	Yes	No	Yes
Davidson, 2017	Partial	—	No	Yes	Yes	Yes	—	—	Yes	No	Yes
Diez-Alegria, 2006	Partial	Partial [a]	No	Partial	Partial	Yes	Yes	Partial	Yes	No	Yes
Fear, 1996	Unclear	Unclear	No	No	Partial	Partial	Partial	—	Yes	No	Yes
Fornells-Ambrojo, 2009	Yes	Partial [a]	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Jolley, 2006	Yes	Unclear	No	No	Yes	Yes	—	—	Yes	Partial [b]	Yes

Author/study	Unbiased selection of cohort?	Selection minimizes baseline differences in prognostic factors?	Sample size calculation?	Adequate description of the cohort?	Validated method for ascer-taining psychotic disorder?	Validated method for ascertaining persecutory delusions or measuring paranoia/ persecutory ideation?	Validated method for ascertaining absence of diagnosis?	Validated method for ascer-taining depression?	Validated method of measuring intern-alising attribution bias?	Outcome assess-ments blind to clinical status?	Missing data low or adequately handled?
Kaney, 1989	Unclear	Partial [a]	No	Yes	Yes	Yes	Partial	Yes	Yes	No	Yes
Kinderman, 1997	Partial	Unclear	No	Partial	Partial	Yes	Partial	Partial	Yes	No	Yes
Lee, 2004	Yes	Partial	No	Partial	Yes	Yes	Partial	—	Yes	No	Yes
Lincoln, 2010	Yes	Yes	No	Yes	Yes	Yes	Partial	—	Yes	No	Yes
Lyon, 1994	Partial	Partial [a]	No	Yes	Yes	Yes	Partial	Yes	Yes	No	Yes
Martin, 2002	Yes	Partial [a]	No	Yes	Yes	Yes	Yes	—	Yes	No [c]	Yes
McKay, 2005	Yes	No	No	Yes	Yes	Yes	Yes	—	Yes	No [c]	Yes
Mehl, 2010	Yes	Yes	No	Yes	Yes	Yes	Yes	—	Yes	No	Unclear
Mehl, 2014	Yes	Yes	No	Yes	Yes	Yes	Yes	—	Yes	Partial [b]	Yes

Author/study	Unbiased selection of cohort?	Selection minimizes baseline differences in prognostic factors?	Sample size calculation?	Adequate description of the cohort?	Validated method for ascer-taining psychotic disorder?	Validated method for ascertaining persecutory delusions or measuring paranoia/ persecutory ideation?	Validated method for ascertaining absence of diagnosis?	Validated method for ascer-taining depression?	Validated method of measuring intern-alising attribution bias?	Outcome assess-ments blind to clinical status?	Missing data low or adequately handled?
Melo, 2006	Yes	No	No	Yes	Yes	Yes	Yes	—	Yes	No	Yes
Melo, 2013	Yes	Yes	No	Yes	Yes	Yes	Yes	—	Unclear	No	Yes
Menon, 2013	Yes	—	No	Yes	Yes	Yes	—	—	Yes	No	Yes
Moritz, 2007	Yes	Partial [a]	No	Yes	Yes	Yes	Yes	Yes	Yes	No [b]	Yes
Randall, 2003	Unclear	No	No	Yes	Partial	Yes	Unclear	—	Yes	No [c]	Yes
Randjbar, 2011	Partial	Partial	No	Yes	Yes	Yes	Yes	—	Yes	No [c]	Yes
Sanford, 2017	Yes	No	No	Yes	Yes	Yes	Yes	—	Yes	No	Yes
Sharp, 1997	Partial	Partial [a]	No	Partial	Yes	Yes	Partial	—	Yes	No	Yes

[a]Studies were given a partial rating when different group comparison ratings were achieved within the study but where at least one was rated ‘yes’ or ‘partial’.
[b]Raters blinded to the treatment allocations (but not to clinical status).
[c]Independent-judge ratings of the participant’s attributional style were blind to clinical status. However, self-ratings were prioritised.

Meta-Analytic Outcomes

Forest plots relating to the internal attributional bias are presented below (Fig. 2 to Fig. 3) and a summary of the meta-analytic findings is shown in Table 3.

Internalising Attributional Bias

Individuals with persecutory delusions had a significantly greater internalising attributional bias for positive events than individuals with depression (k = 7; N = 298; g = 0.79; 95% CI = 0.23 to 1.35; I^2 = 80%; very low-quality evidence). However, there was no significant difference in the internalising attributional bias between individuals with persecutory delusions and healthy controls (k = 21; N = 1,154; g = 0.05; 95% CI = -0.13 to 0.22; I^2 = 47%; low-quality evidence) or those with non- paranoid psychosis (k = 11; N = 451; g = -0.03; 95% CI = -0.22 to 0.17; I^2 = 4%; moderate-quality evidence). Also there was no significant correlation between paranoia severity and the internalising attributional bias in individuals with psychosis (k = 15; N = 595; r = 0.04; 95% CI = -0.07 to 0.16; I^2 = 43%; low-quality evidence).

Sensitivity Analysis

Sensitivity analysis was conducted to assess any differences in internalising attributional bias outcomes when independent judges' ratings were prioritised over participants' self-ratings; 4 studies reported both types of ratings (Martin & Penn, 2002; McKay, Langdon, & Coltheart, 2005; Randall, Corcoran, Day, & Bentall, 2003; Randjbar, Veckenstedt, Vitzthum, Hottenrott, & Moritz, 2011). One difference was that there was a small positive correlation between paranoia severity and the internalising attributional bias in people with psychosis (k = 15; N = 595; r = 0.11; 95% CI = 0.02 to 0.19; I^2 = 16%; moderate quality evidence). Substituting independent judges' ratings instead of participants' self-ratings did not make any substantive difference to the other outcomes: as before, there was no significant difference in the internalising attributional bias between people with persecutory delusions and healthy controls (k = 21; N = 1,154; g = 0.13; 95% CI = -0.03 to 0.29; I^2 = 37%; moderate quality evidence) or those with psychosis without persecutory delusions (k = 11; N =

451; g = 0.13; 95% CI = -0.06 to 0.32; I^2 = 0%; moderate quality evidence). This sensitivity analysis was not relevant to the other group comparison meta-analysis (persecutory delusions vs depression) as all studies in this meta-analysis just reported participants' self-ratings.

Moderator Analyses

The results of the moderator analyses are shown in the right-hand column of Table 3. Neither differences in severity of depression nor matching of groups significantly influenced the effect sizes.

Publication Bias

The third from right column in Table 3 illustrates the LFK indices utilised for the assessment of publication bias. All LFK indices were lower than 2, which means that no publication bias was indicated (Furuya-Kanamori, Barendregt, & Doi, 2018).

Table 3. Summary of meta-analytic findings

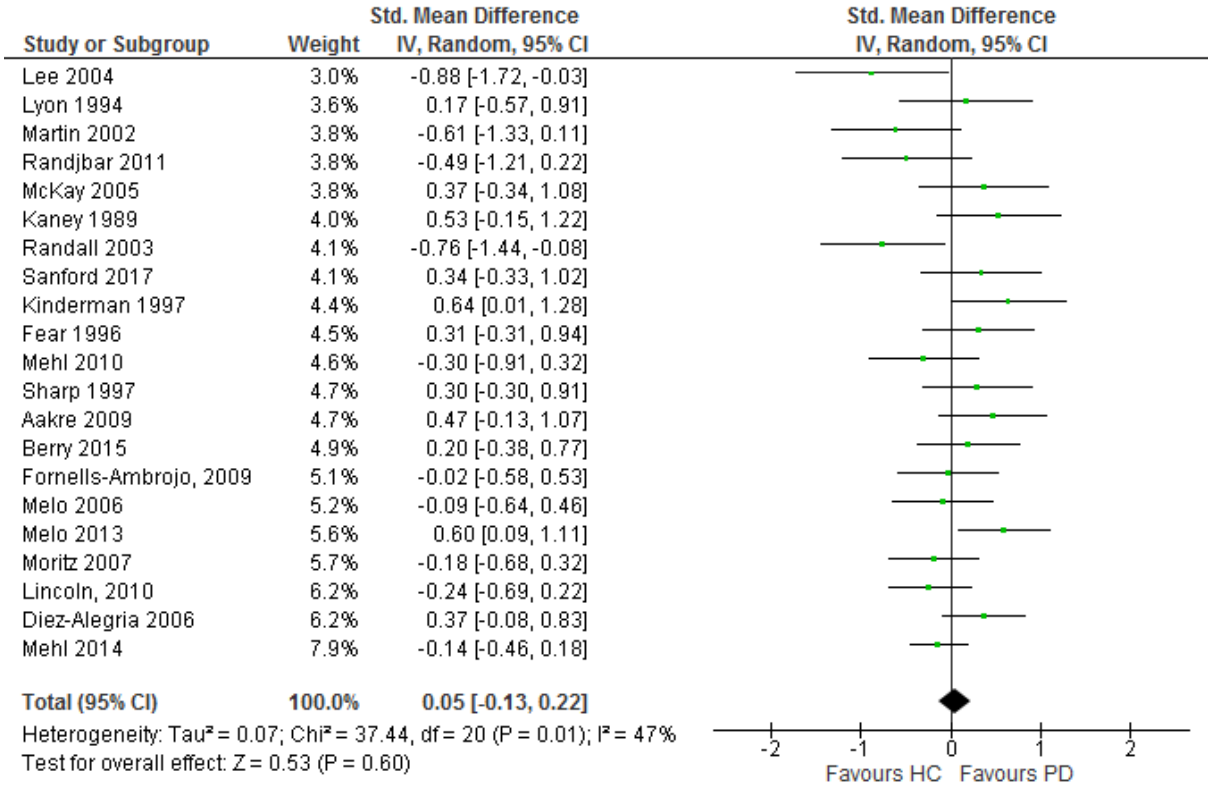
Finding	Number of studies	Number of individuals with psychosis	Number of individuals in control group	Hedge's g, or r (95% CI)	Heterogeneity (I^2; 95% CI) (Chi^2 *P*)	Publication bias (LFK index)	GRADE quality rating	Moderator (N, *B*, SE, *P*)
Difference in IAB between those with psychosis with PDs and healthy controls	21	566	588	g = 0.05 (-0.13, 0.22)	47% (11 – 68) *P* = 0.01	0.27	Low - Imprecision - Inconsistency	MG[a]: N = 13; *B* = 0.28; SE = 0.20; *P* = 0.17 DEP: N = 10; *B* = 0.22; SE = 0.30; *P* = 0.46
Difference in IAB between those with psychosis with PDs and those with psychosis without PDs	11	202	249	g = -0.03 (-0.22, 0.17)	4% (0 – 62) *P* = 0.41	-0.94	Moderate - Imprecision	MG[a]: N = 6; *B* = 0.05; SE = 0.25; *P* = 0.84
Difference in IAB between those with psychosis with PDs and those with depression	7	161	137	g = 0.79 (0.23, 0.1.35)	80% (59 – 90) *P* = 0.0001	—	Very low - Imprecision - Inconsistency - Quality	

Finding	Number of studies	Number of individuals with psychosis	Number of individuals in control group	Hedge's g, or r (95% CI)	Heterogeneity (I^2; 95% CI) (Chi^2 *P*)	Publication bias (LFK index)	GRADE quality rating	Moderator (N, *B*, SE, *P*)
Correlation between magnitude of IAB and paranoia severity	15	595	——	r = 0.04 (-0.07, 0.16)	43% (0 – 69) *P* = 0.04	-1.27	Low - Imprecision - Inconsistency	

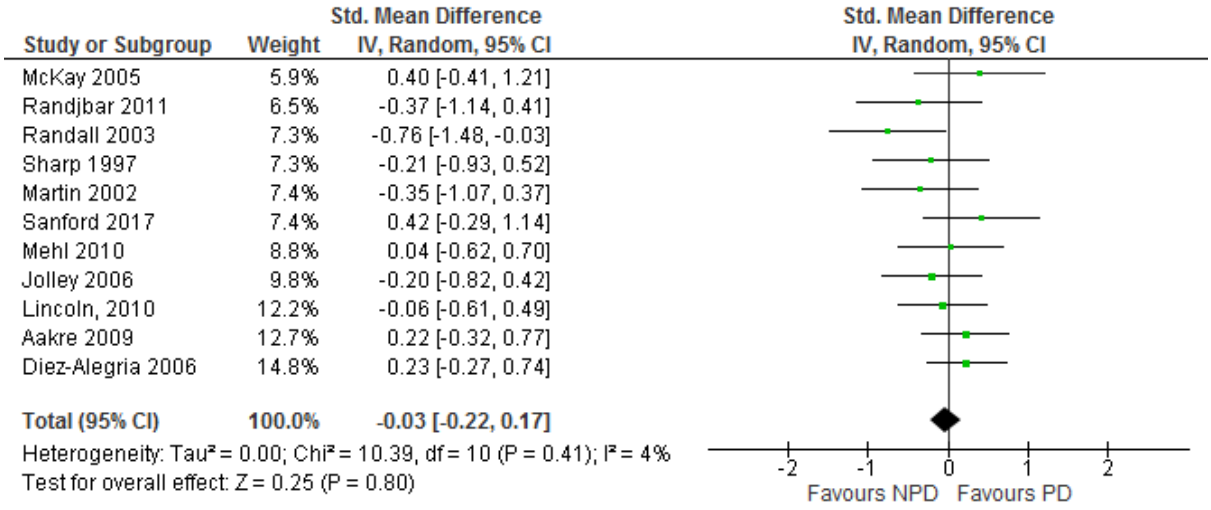
Terms: IAB = Internalising Attributional Bias (for positive events); PDs = Persecutory Delusions.
Moderators: MG = Matching of groups (a binary moderator where 1 = matched. N represents the number of studies where the moderator = 1); DEP = Depression (a continuous moderator measured using SMD, d).

[a]Additional data was provided by the authors.

A IAB – PD v Healthy controls



B IAB – PD v Non-PD psychosis



C

IAB – PD v Depression

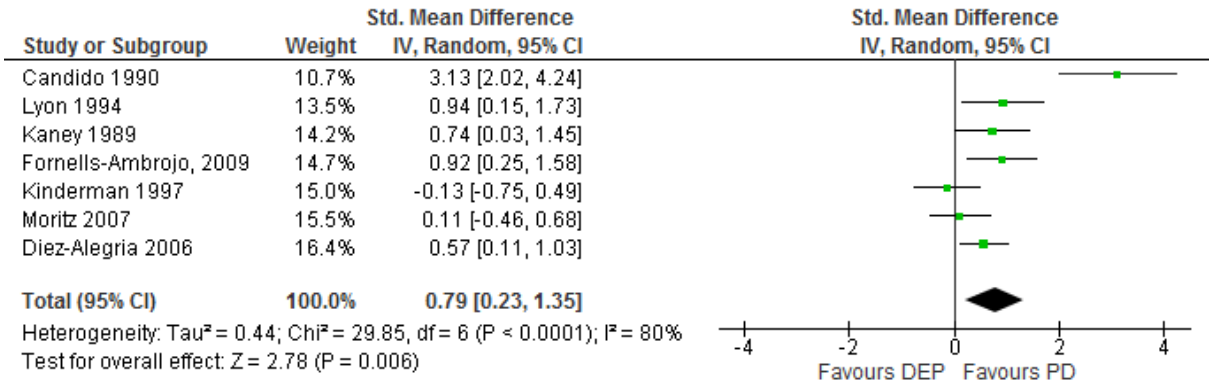


Fig. 2 Forest plots for meta-analyses of internalising attributional bias (IAB). (A) Comparison of IAB between individuals with psychosis with paranoid delusions (PDs) and healthy controls. (B) Comparison of IAB between individuals with psychosis and PDs and individuals with non-paranoid psychosis. (C) Comparison of IAB between individuals with psychosis with PDs and depressed individuals.

IAB and PD Severity

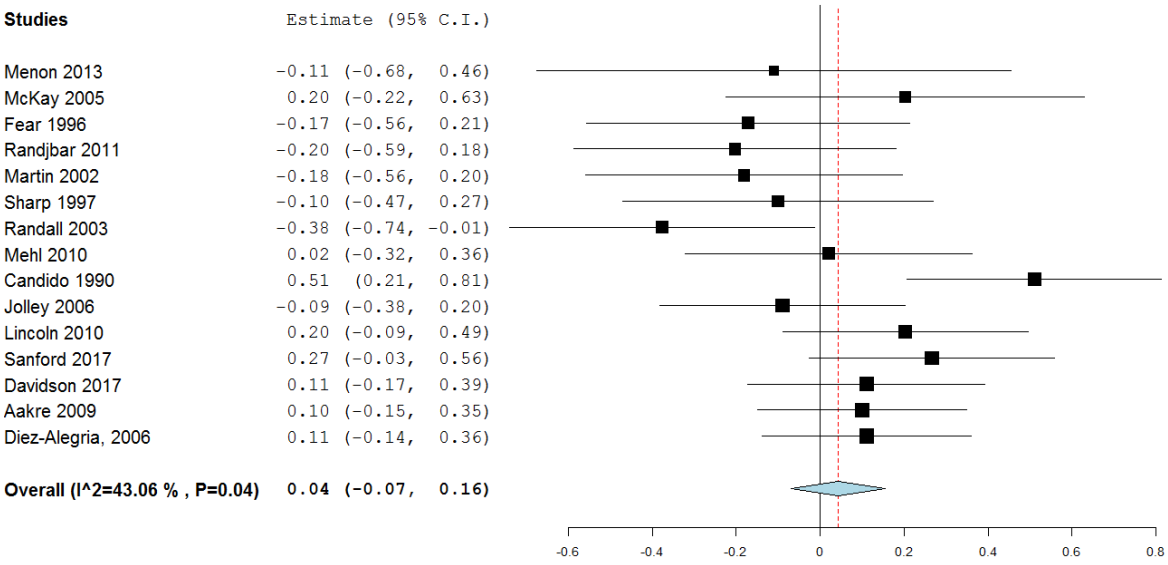


Fig. 3 Forest plot of correlation between internalising attributional bias and paranoia severity in people with psychosis.

Discussion

Summary of the findings

This meta-analysis offers a robust evaluation of an assumption of the paranoia as a defence account of persecutory delusions (Bentall et al., 1994). We utilised 25 studies, consisting of 1794 participants, to conduct a systematic review and meta-analysis exploring whether those experiencing persecutory delusions were more likely to present with an internal attributional bias for positive events when compared to those with depression, non-paranoid psychosis, and healthy controls. Furthermore, correlation analysis explored the association between the magnitude of internalising attributional bias and paranoia severity in individuals with psychosis. Finally, two pre-specified moderator analyses were explored to examine the impact of matching of sample demographics and depression on the overall estimates of effect.

Consistent with the 'paranoia as a defence' account, a significant moderate difference in the magnitude of internal attributions for positive events was observed between those with persecutory delusions and individuals with depression, though the quality of the evidence was very low. Though the evidence was of low-quality, it was found that those who experience persecutory delusions take personal credit for positive events to a similar degree as healthy controls. Moreover, moderate-quality meta-analytic evidence demonstrated that there was no difference in the magnitude of internal attributions for positive events between those experiencing persecutory delusions and those with psychosis without persecutory delusions. There was no significant correlation between internal attributions for positive events and the severity of persecutory delusions. When independent judge-ratings replaced self-ratings on 4 studies, a small positive correlation was found between internal attributions for positive events and severity of persecutory delusions. Moderator analysis revealed that neither depression, nor the matching of groups, had any significant impact on effect size.

Discussion of the findings

The findings from this meta-analysis will now be discussed in relation to our original hypotheses. The first hypothesis was that those with persecutory delusions would demonstrate an exaggerated internal attributional bias for positive events compared to those with non-paranoid psychosis, depression, and healthy controls. The second hypothesis was that the magnitude of paranoia will be associated with an internalising attributional bias for positive events. A limitation to be considered is that the findings provided insufficient evidence pertaining to an internalising attributional bias and more evidence is required.

Firstly, our findings are not consistent with the hypothesis that those experiencing persecutory delusions present with an exaggerated internal attributional bias for positive events. Those experiencing persecutory delusions appeared to demonstrate an internal attributional bias for positive events when compared to those with depression. However, there were no differences in attributional style for positive events when compared to those with non-paranoid psychosis and healthy controls. It has been suggested in the literature that non-clinical populations engage in a self-serving bias consisting of a tendency to take credit for positive events, whilst externalising blame for negative events, as part of maintaining self-esteem equilibrium (Campbell & Sedikides, 1999). Those with a negative self-image, such as individuals with depression, have been shown to exhibit the opposite trend and internalise negative events whilst externalising positive events (Bentall et al., 1994). In contrast, some studies have shown that those with persecutory delusions exhibit an exaggeration of the self-serving bias (Aakre et al., 2009; Candido & Romney, 1990; Kaney & Bentall, 1989; Melo & Bentall, 2013). This led to the development of the self-defence account of persecutory delusions, whereby those with paranoid delusions were presumed to take excessive credit for positive events and excessively blame other individuals for negative events to prevent their subconscious low self-esteem reaching consciousness (Bentall et al., 1994). Our findings suggest that those with persecutory delusions appear to take personal credit for positive events in a healthy way, emphasised by the fact there were no significant differences between those with non-paranoid psychosis and healthy controls. The finding that they did exhibit an internal attributional bias compared to individuals with depression is consistent with the paranoia as a defence

account (Bentall et al., 1994), however, it is plausible that this finding reveals more about depression as a pathology than it does paranoid psychosis.

Secondly, as part of our analyses, we tested the hypothesis that an internal attributional bias was associated with paranoia severity. The lack of a positive correlation between internal attributions for positive events and paranoia severity in our results suggests that there is no linear association. Interestingly, when 4 of our studies substituted self-ratings for independent judge-ratings of attributional style, there was a small positive correlation between internalising attributions for positive events and paranoia severity. Discrepancies between self-ratings and independent judge-ratings have been observed in the literature (Martin & Penn, 2002; McKay et al., 2005; Randjbar et al., 2011). Bentall et al. (2001) has discussed the use of judge-ratings on measures of attributional style and reported that, whilst participant and judge-ratings can be discrepant, it is not clear which is most meaningful regarding attributional style. It could be presumed that participant self-ratings are the most meaningful reflection of their attributional experience. However, psychosis is defined as a disturbance of reality perception (McCormack, Tierney, Brennan, Lawlor, & Clarke, 2014), therefore, it could be argued that independent judge-ratings have the potential to be more accurate. That said, the use of judge-ratings could be open to more bias than self-ratings with issues of blinding and interrater-reliability on measures of attributional style. Moreover, even when judge-ratings were prioritised over self-ratings, there were still no significant differences in internal attributional biases for positive events between those with persecutory delusions and those with non-paranoid psychosis.

Finally, it is possible that the quality of evidence available does not allow us to determine with confidence the presence or absence of an exaggerated internalising attributional bias for positive events in those experiencing persecutory delusions. The quality of the meta-analytic evidence was generally low with the exception of one finding. However, our findings were based on a total of 25 domestic and international studies, consisting of 1794 participants, and unreported data was obtained from 7 articles. In comparing those with persecutory delusions to those with depression, only 7 studies were available for meta-analytic analyses and they showed a high level of heterogeneity. A particular issue has been the reporting of findings in the attributional bias literature. Though many articles utilise common attribution measures such as the

IPSAQ (Kinderman & Bentall, 1996) and ASQ (Perterson et al., 1982), the modification of the paranoia as a defence model (Bentall et al., 2001) appears to have resulted in a further shift towards exploring external attributions for negative events. Therefore, many studies either report composite variables, such as 'externalising bias' and 'personalising bias', or they only report participant responses to negative events, despite the fact they have collected the data for attributions for positive events as part of the process. The use of composite variables remains controversial and has been criticised for assuming a relationship between attributional style for positive and negative events (Byrne & MacLeod, 1997). Our findings appear to support such criticisms since the IPSAQ 'externalising bias' score is comprised of subtracting an individual's internal attributions for negative events from their internal attributions for positive events. Our findings are consistent with the notion that those with paranoid delusions take personal credit for positive events in a healthy way, therefore, an 'externalising bias' score could be unreliable and influenced by factors other than paranoia. Whilst we were fortunate to obtain unreported data from 7 authors, many other studies could have been included in our analyses if the attributional data for positive events had been reported.

Overall, whilst the quality of our meta-analytic findings could be improved by further evidence and reporting of attributional biases for positive events, the results do appear to suggest that those with persecutory delusions take personal credit for positive events in a healthy way. Moreover, the association between internalised attributions for positive events and paranoia severity remains unclear. Where independent-judge ratings replaced self-ratings on attributional measures, a small significant positive correlation was found. Since there is little evidence on the reliability of judge-ratings on measures of attribution, we are unsure how meaningful this finding is. The findings do not appear to support our original hypotheses.

Theoretical implications

Our findings do not appear to be consistent with the original 'paranoia as a defence' model of persecutory delusions (Bentall et al., 1994). This was emphasised by the lack of significant differences in internal attributional style for positive events between

those with persecutory delusions and healthy controls. Furthermore, contrary to the suggestion that internalising of positive events in those experiencing paranoid delusions could be protective, individuals with paranoid psychosis exhibited a similar magnitude of internal attributions for positive events as those with non-paranoid psychosis. Moreover, there was no significant correlation between internalising attributional bias for positive events and paranoia severity. Contrary to a key prediction of the original model, Murphy et al. (in preparation) reported that those with persecutory delusions had low explicit self-esteem compared to those with non-paranoid psychosis and healthy controls. They also found that self-esteem instability was associated with paranoia severity. It could be argued that individuals with paranoid psychosis take personal credit for positive events in a healthy way, which is contrary to what we might expect from the self-serving bias literature (Blaine & Crocker, 1993; Campbell & Sedikides, 1999) if those experiencing persecutory delusions have low implicit (similar to depression), and relatively low explicit, self-esteem (Murphy et al., in preparation). One interpretation could be that a self-serving bias is present in those with persecutory delusions when compared to those with depression but, rather than an exaggerated self-serving bias, as proposed by Bentall et al. (1994), the self-serving bias could be defined by a healthy level of internalising of positive events coupled with exaggerated externalising of negative events in individuals with paranoid psychosis (Murphy et al., in preparation). Consistent with a defence account of paranoia, we found that when 4 of our studies substituted self-ratings for independent judge-ratings of attributional style, there was a small positive correlation between internalising attributions for positive events and paranoia severity. As discussed, discrepancies between self and judge ratings have been observed in the literature (Martin & Penn, 2002; McKay et al., 2005; Randjbar et al., 2011), though it remains unclear which type of rating is more meaningful (Bentall et al., 2001). The utility of judge-ratings on measures of attribution therefore requires further empirical investigation.

On balance, our findings perhaps inform our understanding of depression to a greater extent than paranoia. The literature has demonstrated a lack internal attributional bias for positive events in those with depression (Bentall et al., 1994) and this has been attributed to normal emotional processes associated with depressive pathologies

(Garety & Freeman, 2013; Hu, Zhang, & Yang, 2015). Since those with depression have low self-esteem, it could be argued that it is unsurprising that they are less likely to take credit for positive events, thus, this attributional style could be a reflection their low-self-esteem and the cognitions associated with depression (Needles & Abramson, 1990). However, this account does not appear to fully explain our findings that those with paranoid psychosis take personal credit for positive events in a similar way to healthy controls whilst depressed individuals do not, given that they have both been shown to experience global low self-esteem (Murphy et al., in preparation).

The revised 'paranoia as a defence' model (Bentall et al., 2001) addressed issues of low explicit self-esteem by proposing that, for those experiencing paranoid delusions, self-esteem and attributional style are not stable constructs and are influenced cyclically by one another. Murphy et al. (in preparation) offered support to this version of the model as they found that an externalising attributional bias for negative events was present compared to the control groups, and there was an implicit-explicit self-esteem discrepancy in individuals experiencing persecutory delusions compared to those with depression (with implicit self-esteem similar to those with depression and explicit self-esteem significantly higher). Importantly, pivotal to the model, Murphy et al. (in preparation) also demonstrated that self-esteem instability was associated with paranoia severity. Our findings suggest that those with persecutory delusions do not take excessive credit for positive events compared to those with non-paranoid psychosis and healthy controls. These outcomes appear to be consistent with the revised model in which it is suggested that external attributions for negative events only partially fulfil their defensive function (Bentall et al., 2001). Murphy et al. (in preparation) also offered support for an alternate cognitive model of persecutory delusions (Freeman et al., 2002) whereby paranoid delusions are considered a direct reflection of low self-esteem, internal emotional processes, and the associated threat-beliefs. As predicted by the cognitive model (Freeman et al., 2002), self-esteem was negatively correlated to paranoia severity, and no evidence of a greater implicit-explicit self-esteem discrepancy was found between those with paranoid delusions and healthy controls. Our findings that those with persecutory delusions do not demonstrate an exaggerated internalising attributional bias for positive events, coupled

with findings of Murphy et al. (in preparation), also appear to be consistent with the cognitive model of paranoia (Freeman et al., 2002).

In totality, where the 'paranoia as a defence' model (Bentall et al., 2001) appears to overlook certain emotional processes shown to be a feature of paranoia (Freeman et al., 2012), the cognitive model (Freeman et al., 2002) appears to not fully explore the function of attributional and reasoning biases. Perhaps the outcomes in this review, in conjunction with those of Murphy et al. (in preparation), are indicative of the need to consider further refinements to the 'paranoia as a defence' model. Contrary to previous suggestions, our findings indicate that an internalising attributional bias for positive events might be more relevant to depression than paranoid psychosis. However, Murphy et al. (in preparation) have demonstrated the presence of a significant externalising attributional bias for negative events in those with paranoid delusions when compared to control groups. Whilst attributional style could be associated more with mood than paranoia (Garety & Freeman, 2013), the presence of an implicit-explicit self-esteem discrepancy between those with paranoia and those with depression (Murphy et al., in preparation) indicates that external attributions for negative events could plausibly prevent an individual with paranoid delusions from feeling worse in terms of self-esteem. Our findings that an internalising attributional bias for positive events perhaps reveals more about depression than paranoia, appears to emphasise the importance and specificity of external attributions for negative events in paranoid psychosis.

Strengths and limitations

This review utilised 25 studies to conduct a meta-analysis, allowing us to overcome the power limitations of small individual studies reported in relevant systematic reviews (Garety & Freeman, 1999; 2013). Whilst systematic reviews illustrate a picture of the general trends based on the findings of individual studies, they can be susceptible to missing small to moderate effects due to a lack of power (Borenstein, Hedges, Higgins, & Rothstein, 2009). Further strengths of this review include the prospective registration of our meta-analysis protocol, the joint decision-making with ambiguous studies, the independent extraction of data by a second researcher (PM),

and the unreported data acquired from 7 authors. Obtaining unreported data is an important measure in attempting to reduce the risk of selective reporting bias and publication bias (Berlin & Ghersi, 2005; Hopewell, Clarke, & Mallett, 2005).

When interpreting the findings of this review, the following limitations should be considered. Due to the available limited resources, only English language studies were included in the review and almost half of the included studies were conducted in the UK. Clearer reporting of attributional style for positive events in those with paranoid delusions would allow more data to be included in future analyses, thus, improving the reliability of meta-analytic evidence.

Recommendations

One recommendation concerns the use of attributional style questionnaires in the psychosis literature. Tools such as the IPSAQ (Kinderman & Bentall, 1996) and the ASQ (Perterson et al., 1982) frequently result in the reporting of composite scores. Byrne and MacLeod (1997) have criticised this practice as their use assumes a relationship between attributional style for positive and negative events. Whilst evidence supports an externalising attributional style for negative events in individuals experiencing persecutory delusions (Murphy et al., in preparation), the findings in this review suggest that there is no difference in internal attributions for positive events between individuals experiencing persecutory delusions, non-paranoid psychosis, and healthy controls. It is therefore suggested that composite scores on the ASQ and IPSAQ could be unreliable constructs that may be adversely affected by factors other than those associated with paranoid psychosis. Consistent with Byrne and MacLeod (1997), we suggest that these composite scores should be avoided and that attributional style for negative and positive events should always be reported separately.

The separate reporting of attributional style for negative and positive events would also allow future analyses to be more inclusive, since a number of studies only reported findings pertaining to negative events. The inclusion of more studies could potentially improve the reliability of meta-analytic findings. Specifically, more studies exploring the differences in attributional style for positive events between individuals with

paranoid psychosis and depression could prove useful. Interestingly, in line with findings that those with paranoid psychosis present with significantly lower implicit and explicit self-esteem compared to those with non-paranoid psychosis (Murphy et al., in preparation), paranoid individuals exhibited a similar attributional style for positive events to those with non-paranoid psychosis. Future research might look to explore internal attributions for positive events with an emphasis on the specific sub-types of paranoia first described by Trower & Chadwick (1995). Some evidence has suggested a difference in both internal and external attributional styles between those deemed to have 'bad me' and 'poor me' paranoia (Melo & Bentall, 2013).

Furthermore, Bentall et al. (2001) discussed the potential discrepancies between participant and independent judge ratings of attributional style when using attribution measures. This could be a potential avenue of future research since it is unclear which interpretation of attribution is most meaningful. Evidence from this study suggested that replacing self-ratings with judge-ratings, even for a small number of studies, provided one significant finding; a positive correlation between internalising attribution for positive events and paranoia severity. Though the relevance of this finding is unclear, and the correlation was small, further investigation regarding the utility of judge-ratings on attributional style measures is required.

Finally, the revised 'paranoia as a defence' model describes unstable self-esteem and attributional processes (Bentall et al., 2001). All of the studies included in this review are cross-sectional observational studies. A revision in methodology use may be required since these studies are unlikely to capture the dynamic nature of attributional style proposed by Bentall and colleagues. The Experience-Sampling Method (ESM) is one possible approach that has been described as a reliable and valuable tool in capturing live information from participants (Csikszentmihalyi & Larson, 2014).

Clinical implications

The role of the internalising attributional bias for positive events in clinical paranoia remains a topic of interest and further research is required to fully understand its role, if any, in the maintenance and treatment of persecutory delusions. The findings in this

study that those with paranoid delusions present with a greater internalising attributional bias for positive events compared to those with depression, could be reflective of a defensive self-serving bias, or it could be more reflective of both disorders as separate emotional pathologies. Since there were no differences in attributional biases for positive events between individuals with persecutory delusions, those with non-paranoid psychosis, and healthy controls, it is unlikely that encouraging paranoid patients to take responsibility for positive events will worsen paranoia, though this requires further empirical investigation.

Summary

In summary, the findings from this meta-analysis suggest that those with paranoid psychosis do not take excessive credit for positive events, but they do appear to take credit for positive events to a similar degree as healthy controls, and significantly more so than those with depression. When considering the findings of Murphy et al. (in preparation), who suggest that individuals experiencing persecutory delusions demonstrate a greater externalising bias for negative events, low implicit self-esteem of a similar level to those with depression, and a higher level of explicit self-esteem compared to those with depression, our findings offer some support to the idea that attributional style in individuals with paranoid delusions is self-defensive compared to those with depression, with a specific emphasis on the externalising of blame for negative events. Internalising attributions for positive events could be expected in depressed individuals as a direct reflection of their low self-esteem and the associated internal emotional processes (Hu, Zhang, & Yang, 2015; Needles & Abramson, 1990). Questions remain over the findings due to the reliability of the evidence pertaining to the internalising attributional biases in paranoia. Clearer reporting of attributional style for positive events in the literature and less reporting of composite variables could help provide further evidence. As noted by Murphy et al. (in preparation), both defensive and cognitive models of paranoia appear to offer an interpretation of the findings, with neither wholly accounting for the outcomes. Differences between independent judge-ratings and self-ratings on attributional measures warrants further empirical investigation.

References

Aakre, J. M., Seghers, J. P., St-Hilaire, A., & Docherty, N. (2009). Attributional style in delusional patients: A comparison of remitted paranoid, remitted nonparanoid, and current paranoid patients with nonpsychiatric controls. *Schizophrenia Bulletin*, *35*(5), 994–1002. https://doi.org/10.1093/schbul/sbn033

Barendregt, J., & Doi, S. A. (2016). MetaXL User Guide version 5.3.

Bentall, R. P., Corcoran, R., Howard, R., Blackwood, N., & Kinderman, P. (2001). Persecutory delusions: A review and theoretical integration. *Clinical Psychology Review*. https://doi.org/10.1016/S0272-7358(01)00106-4

Bentall, R. P., Kinderman, P., & Kaney, S. (1994). The self, attributional processes and abnormal beliefs: Towards a model of persecutory delusions. *Behaviour Research and Therapy*, *32*(3), 331–341. https://doi.org/10.1016/0005-7967(94)90131-7

Berlin, J. A., & Ghersi, D. (2005). Preventing publication bias: Registries and prospective meta-analysis. *Publication bias in meta-analysis: Prevention, assessment and adjustments*, 35-48. https://doi.org/10.1002/0470870168.ch3

Berman, N. G., & Parker, R. a. (2002). Meta-analysis: neither quick nor easy. *BMC Medical Research Methodology*, *2*, 10. https://doi.org/10.1186/1471-2288-2-10

Berry, K., Bucci, S., Kinderman, P., Emsley, R., & Corcoran, R. (2015). An investigation of attributional style, theory of mind and executive functioning in acute paranoia and remission. *Psychiatry Research*, *226*(1), 84–90. https://doi.org/10.1016/j.psychres.2014.12.009

Byrne, A., & MacLeod, A. K. (1997). Attributions and accessibility of explanations for future events in anxiety and depression. *British Journal of Clinical Psychology*, *36*(4), 505-520. https://doi.org/10.1111/j.2044-8260.1997.tb01257.x

Borenstein, M., Hedges, L. V, Higgins, J. P. T., & Rothstein, H. R. (2009). Vote Counting – A New Name for an Old Problem. *Introduction to Meta-Analysis*, (1980), 251–255. https://doi.org/10.1002/9780470743386.ch28

Campbell, W. K., & Sedikides, C. (1999). Self-threat magnifies the self-serving bias: A meta-analytic integration. *Review of general Psychology*, *3*(1), 23. http://dx.doi.org/10.1037/1089-2680.3.1.23

Candido, C. L., & Romney, D. M. (1990). Attributional style in paranoid vs. depressed patients. *British Journal of Medical Psychology*, *63*(4), 355–363. https://doi.org/10.1111/j.2044-8341.1990.tb01630.x

Cohen, J. (1988). Statistical power analysis for the behavioral sciences. *Statistical Power Analysis for the Behavioral Sciences*. https://doi.org/10.1234/12345678

Coid, J. W., Ullrich, S., Kallis, C., Keers, R., Barker, D., Cowden, F., & Stamps, R. (2013). The Relationship Between Delusions and Violence: Findings From the East London First Episode Psychosis Study. *JAMA Psychiatry (Chicago, Ill.)*, *70*(5), 1–7. https://doi.org/10.1001/jamapsychiatry.2013.12

Csikszentmihalyi, M., & Larson, R. (2014). Validity and reliability of the experience-sampling method. In *Flow and the foundations of positive psychology* (pp. 35-54). Springer Netherlands.

Davidson, C. A., Lesser, R., Parente, L. T., & Fiszdon, J. M. (2017). Psychometrics of social cognitive measures for psychosis treatment research. *Schizophrenia research*, *193*, 51-57. https://doi.org/10.1016/j.schres.2017.06.018

DerSimonian, R., & Laird, N. (1986). Meta-analysis in clinical trials. *Controlled Clinical Trials*, *7*(3), 177–88. https://doi.org/10.1016/0197-2456(86)90046-2

Diez-Alegría, C., Vázquez, C., Nieto-Moreno, M., Valiente, C., & Fuentenebro, F. (2006). Personalizing and externalizing biases in deluded and depressed patients: are attributional biases a stable and specific characteristic of delusions? *The British Journal of Clinical Psychology / the British Psychological Society*, *45*(Pt 4), 531–44. https://doi.org/10.1348/014466505X86681

Duval, S., Tweedie, R., Taylor, S., & Tweedie, R. (2000). Trim and fill: A Simple Funnel Plot Based Method of Testing and Adjusting for Publication Bias in Meta-analysis. *Biometrics*, *56*(2), 455–463. https://doi.org/10.1111/j.0006-341x.2000.00455.x

Fear, C., Sharp, H., & Healy, D. (1996). Cognitive processes in delusional disorders. *British Journal of Psychiatry*, *168*(JAN.), 61–67. https://doi.org/10.1192/bjp.168.1.61

Fornells-Ambrojo, M., & Garety, P. A. (2009). Understanding attributional biases, emotions and self-esteem in "poor me" paranoia: findings from an early psychosis sample. *The British Journal of Clinical Psychology / the British Psychological Society*, *48*(Pt 2), 141–62. https://doi.org/10.1348/014466508X377135

Freeman, D. (2016). Persecutory delusions: a cognitive perspective on understanding and treatment. *The Lancet Psychiatry*, *3*(7), 685-692. https://doi.org/10.1016/S2215-0366(16)00066-3

Freeman, D., Garety, P. A., Kuipers, E., Fowler, D., & Bebbington, P. E. (2002). A cognitive model of persecutory delusions. *British Journal of Clinical Psychology*, *41*(4), 331–347. https://doi.org/10.1348/014466502760387461

Freeman, D., Stahl, D., McManus, S., Meltzer, H., Brugha, T., Wiles, N., & Bebbington, P. (2012). Insomnia, worry, anxiety and depression as predictors of the occurrence and persistence of paranoid thinking. *Social psychiatry and psychiatric epidemiology*, *47*(8), 1195-1203. https://doi.org/10.1007/s00127-011-0433-1

Furukawa, T. A., Barbui, C., Cipriani, A., Brambilla, P., & Watanabe, N. (2006). Imputing missing standard deviations in meta-analyses can provide accurate results. *Journal of Clinical Epidemiology*, *59*(1), 7–10. https://doi.org/10.1016/j.jclinepi.2005.06.006

Furuya-Kanamori, L., Barendregt, J. J., & Doi, S. A. (2018). A new improved graphical and quantitative method for detecting bias in meta-analysis. *International journal of evidence-based healthcare*. https://doi.org/10.1097/XEB.0000000000000141

Garety, P. A., & Freeman, D. (1999). Cognitive approaches to delusions: a critical review of theories and evidence. *The British Journal of Clinical Psychology / the British Psychological Society*, *38 (Pt 2)*, 113–154. https://doi.org/10.1348/014466599162700

Garety, P. A., & Freeman, D. (2013). The past and future of delusions research: From the inexplicable to the treatable. *British Journal of Psychiatry*. https://doi.org/10.1192/bjp.bp.113.126953

Guyatt, G. H., Oxman, A. D., Vist, G. E., Kunz, R., Falck-Ytter, Y., Alonso-Coello, P., & Schünemann, H. J. (2008). GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ (Clinical research ed.)*, *336*(7650), 924-926. https://doi.org/10.1136/bmj.39489.470347.AD

Higgins, J. P. T., & Green, S. (2011). Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]. In *The Cochrane Collaboration* (p. Table 7.7.a: Formulae for combining groups).

Hopewell, S., Clarke, M., & Mallett, S. (2005). Grey literature and systematic reviews. *Publication bias in meta-analysis: Prevention, assessment and adjustments*, 48-72.

Hor, K., & Taylor, M. (2010). Suicide and schizophrenia: a systematic review of rates and risk factors. *Journal of psychopharmacology*, *24*(4_suppl), 81-90. https://doi.org/10.1177/1359786810385490

Hu, T., Zhang, D., & Yang, Z. (2015). The relationship between attributional style for negative outcomes and depression: A meta-analysis. *Journal of Social and Clinical Psychology*, *34*(4), 304-321. https://doi.org/10.1521/jscp.2015.34.4.304

Jolley, S., Garety, P., Bebbington, P., Dunn, G., Freeman, D., Kuipers, E., … Hemsley, D. (2006). Attributional style in psychosis-The role of affect and belief type. *Behaviour Research and Therapy*, *44*(11), 1597–1607. https://doi.org/10.1016/j.brat.2005.12.002

Kaney, S., & Bentall, R. P. (1989). Persecutory delusions and attributional style. *Psychology and Psychotherapy: Theory, Research and Practice*, *62*(2), 191-198. https://doi.org/10.1111/j.2044-8341.1989.tb02826.x

Keers, R., Ullrich, S., DeStavola, B. L., & Coid, J. W. (2014). Association of violence with emergence of persecutory delusions in untreated schizophrenia. *American Journal of Psychiatry*, *171*(3), 332-339. https://doi.org/10.1176/appi.ajp.2013.13010134

Kesting, M. L., & Lincoln, T. M. (2013). The relevance of self-esteem and self-schemas to persecutory delusions: A systematic review. *Comprehensive Psychiatry*, *54*(7), 766–789. https://doi.org/10.1016/j.comppsych.2013.03.002

Kinderman, P., & Bentall, R. P. (1996). A new measure of causal locus: the internal, personal and situational attributions questionnaire. *Personality and Individual differences*, *20*(2), 261-264. https://doi.org/10.1016/0191-8869(95)00186-7

Lee, D. a, Randall, F., Beattie, G., & Bentall, R. P. (2004). Delusional discourse: an investigation comparing the spontaneous causal attributions of paranoid and non-paranoid individuals. *Psychology and Psychotherapy*, *77*(Pt 4), 525–540. https://doi.org/10.1348/1476083042555361

Lincoln, T. M., Mehl, S., Exner, C., Lindenmeyer, J., & Rief, W. (2010). Attributional style and persecutory delusions. Evidence for an event independent and state specific external-personal attribution bias for social situations. *Cognitive Therapy and Research*, *34*(3), 297–302. https://doi.org/10.1007/s10608-009-9284-4

Lyon, H. M., Kaney, S., & Bentall, R. P. (1994). The defensive function of persecutory delusions. Evidence from attribution tasks. *British Journal of Psychiatry*, *164*(MAY), 637–646. https://doi.org/10.1192/bjp.164.5.637

Martin, J. A., & Penn, D. L. (2002). Attributional Style in Schizophrenia: An Investigation in Outpatients With and Without Persecutory Delusions. *Schizophrenia Bulletin*, *28*(1), 31–41. https://doi.org/10.1093/oxfordjournals.schbul.a006916

McCormack, M., Tierney, K., Brennan, D., Lawlor, E., & Clarke, M. (2014). Lack of insight in psychosis: theoretical concepts and clinical aspects. *Behavioural and cognitive psychotherapy*, *42*(3), 327-338. https://doi.org/10.1017/S1352465813000155

McKay, R., Langdon, R., & Coltheart, M. (2005). Paranoia, persecutory delusions and attributional biases. *Psychiatry Research*, *136*(2–3), 233–245. https://doi.org/10.1016/j.psychres.2005.06.004

Mehl, S., Landsberg, M. W., Schmidt, A. C., Cabanis, M., Bechdolf, A., Herrlich, J., … Wagner, M. (2014). Why do bad things happen to me? Attributional style, depressed mood, and persecutory delusions in patients with schizophrenia. *Schizophrenia Bulletin*, *40*(6), 1338–1346. https://doi.org/10.1093/schbul/sbu040

Mehl, S., Rief, W., Lullmann, E., Ziegler, M., Muller, M. J., & Lincoln, T. M. (2010). Implicit attributional style revisited: Evidence for a state-specific "self-decreasing" implicit attributional style in patients with persecutory delusions. *Cognitive Neuropsychiatry*. https://doi.org/10.1080/13546801003640419

Melo, S. S., & Bentall, R. P. (2013). "Poor me" versus "Bad me" paranoia: The association between self-beliefs and the instability of persecutory ideation. *Psychology and Psychotherapy: Theory, Research and Practice*, *86*(2), 146–163. https://doi.org/10.1111/j.2044-8341.2011.02051.x

Melo, S. S., Taylor, J. L., & Bentall, R. P. (2006). " Poor me " versus " bad me " paranoia and the instability of persecutory ideation Copyright © The British Psychological Society. *Psychology and Psychotherapy*, *79*(2), 271–287. https://doi.org/10.1348/147608305X52856

Menon, M., Addington, J., & Remington, G. (2013). Examining cognitive biases in patients with delusions of reference. *European Psychiatry*, *28*(2), 71–73. https://doi.org/10.1016/j.eurpsy.2011.03.005

Mizrahi, R., Addington, J., Remington, G., & Kapur, S. (2008). Attribution style as a factor in psychosis and symptom resolution. *Schizophrenia Research*, *104*(1–3), 220–227. https://doi.org/10.1016/j.schres.2008.05.003

Moher, D., Liberati, A., Tetzlaff, J., Altman, D., & The PRISMA Group. (2009). Preferred Reporting / tems for Systematic Reviews and Meta-Analysis: The PRISMA Statement. *PLoSMed*. https://doi.org/10.1371/journal.pmed1000097

Moritz, S., Woodward, T. S., Burlon, M., Braus, D. F., & Andresen, B. (2007). Attributional style in schizophrenia: Evidence for a decreased sense of self-causation in currently paranoid patients. *Cognitive Therapy and Research*, *31*(3), 371–383. https://doi.org/10.1007/s10608-006-9070-5

Murphy, P., Bentall, R. P., Freeman, D., O'Rourke, S., & Hutton, P. (in preparation). The 'paranoia-as-defence' model of persecutory delusions: A systematic review and meta-analysis.

Needles, D. J., & Abramson, L. Y. (1990). Positive life events, attributional style, and hopefulness: Testing a model of recovery from depression. *Journal of Abnormal Psychology*, *99*(2), 156. http://psycnet.apa.org/doi/10.1037/0021-843X.99.2.156

Paolini, E., Moretti, P., & Compton, M. T. (2016). Delusions in first-episode psychosis: Principal component analysis of twelve types of delusions and demographic and clinical correlates of resulting domains. *Psychiatry research*, *243*, 5-13. https://doi.org/10.1016/j.psychres.2016.06.002

Peterson, C., Semmel, A., von Baeyer, C., Abramson, L. Y., Metalsky, G. I., & Seligman, M. E. P. (1982). The attributional Style Questionnaire. *Cognitive Therapy and Research*, *6*(3), 287–299. https://doi.org/10.1007/BF01173577

Randall, F., Corcoran, R., Day, J., & Bentall, R. (2003). Attention, theory of mind, and causal attributions in people with persecutory delusions: A preliminary investigation. *Cognitive Neuropsychiatry*, *8*(4), 287–294. https://doi.org/10.1080/135468000057

Randjbar, S., Veckenstedt, R., Vitzthum, F., Hottenrott, B., & Moritz, S. (2011). Attributional biases in paranoid schizophrenia: Further evidence for a decreased sense of self-causation in paranoia. *Psychosis*, *3*(1), 74–85. https://doi.org/10.1080/17522431003717675

Review Manager (RevMan) for Windows. Version 5.3. Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2014.

Sanford, N., & Woodward, T. S. (2017). Symptom-related attributional biases in schizophrenia and bipolar disorder. *Cognitive neuropsychiatry*, *22*(4), 263-279. https://doi.org/10.1080/13546805.2017.1314957

Sharp, H. M., Fear, C. F., & Healy, D. (1997). Attributional style and delusions: An investigation based on delusional content. *European Psychiatry*, *12*(1), 1–7. https://doi.org/10.1016/S0924-9338(97)86371-7

Tiernan, B., Tracey, R., & Shannon, C. (2014). Paranoia and self-concepts in psychosis: A systematic review of the literature. *Psychiatry Research*. https://doi.org/10.1016/j.psychres.2014.02.003

Trower, P., & Chadwick, P. (1995). Pathways to Defense of the Self: A Theory of Two Types of Paranoia. *Clinical Psychology: Science and Practice*, *2*(3), 263–278. https://doi.org/10.1111/j.1468-2850.1995.tb00044.x

Wallace, B. C., Lajeunesse, M. J., Dietz, G., Dahabreh, I. J., Trikalinos, T. A., Schmid, C. H., … Gurevitch, J. (2017). OpenMEE: Intuitive, open-source software for meta-analysis in ecology and evolutionary biology. *Methods in Ecology and Evolution, 8,* 941-947.

Williams, J. W., Plassman, B. L., Burke, J., Holsinger, T., & Benjamin, S. (2010). Preventing Alzheimer's disease and cognitive decline. *Evidence report/technology assessment*, *193*(1), 1-727. doi:10.1059/0003-4819-153-3-201008030-00258.

Wilson, D. B. (2018). Practical Meta-Analysis Effect Size Calculator. Retrieved from https://www.campbellcollaboration.org/escalc/html/EffectSizeCalculator-Home.php

Wimberley, T., Støvring, H., Sørensen, H. J., Horsdal, H. T., MacCabe, J. H., & Gasse, C. (2016). Predictors of treatment resistance in patients with schizophrenia: a population-based cohort study. *The Lancet Psychiatry*, *3*(4), 358-366. https://doi.org/10.1016/S2215-0366(15)00575-1

Supplementary appendix contents

A. Review Protocol

Title: Persecutory delusions and the internalising attributional bias for positive events: protocol for a systematic review and meta-analysis

Reviewers: David Barker, Paul Hutton, Emily Newman, Ethel Quayle, Louise Tansey, Philip Murphy

Review question(s)

Magnitude of internalising attributional bias for positive events:

1) Do people with psychosis with persecutory delusions have a greater internalising attributional bias for positive events than people with depression?

2) Do people with psychosis with persecutory delusions have a greater internalising attributional bias for positive events than healthy controls?

3) Do people with psychosis with persecutory delusions have a greater internalising attributional bias for positive events than people with psychosis without persecutory delusions (and, if specified, grandiose delusions)?

4) Is there a positive correlation between paranoia severity and the degree of internalising attributional bias for positive events?

Searches

The search strategy is yet to be finalised, however, a librarian experienced in database searches will be consulted as part of the process. In line with previous reviews, the search will include the following databases: PsycINFO, MEDLINE, EMBASE and Web of Science. Hand searches of references in eligible articles and key review articles will be undertaken. In every case where useable but unpublished data is thought to exist, the relevant authors will be contacted. As a final step, all corresponding authors of included studies will be contacted for any further unpublished data. Only English language studies will be included.

Types of study to be included

Case-control, cross-sectional correlational, and prospective designs will be included. Baseline data from experimental designs and intervention trials may also be included; however, outcome data or data that has been manipulated in these types of studies will be excluded.

Condition or domain being studied

Psychosis, persecutory delusions, and the internalising attributional bias for positive events.

Participants/ population

Studies will be eligible for inclusion in the group comparison analyses if they contain a sample of people with a schizophrenia spectrum condition (referred to in this protocol as "psychosis") where at least half of the sample have persecutory delusions. Studies without control group data will be eligible for inclusion in the correlation analysis if at least half of the sample have psychosis and correlation or

regression data is reported between a measure of paranoia/persecutory ideation and the construct of interest. Studies comparing people with psychosis with current persecutory delusions to people with psychosis without persecutory delusions will also be eligible for inclusion in the correlation analysis. Exclusion criteria includes studies where over half of the sample have co-morbid diagnoses of an intellectual disability, bipolar disorder, a primary diagnosis of substance-induced psychosis, or psychosis that is secondary to a general medical condition or organic pathology.

Intervention(s), exposure(s)

Not applicable.

Comparator(s)/ control

People with depression, people with psychosis without persecutory delusions (and, if specified, grandiose delusions), and healthy controls will be included as comparators.

Context

No limitation on settings.

Outcome(s)

Primary outcomes

The primary outcome for this review is the magnitude to which internal attributions for positive events are made. Attributions are typically measured via questionnaires such as the Internal, Personal, and Situational Attrributions Questionnaire (IPSAQ; Kinderman & Bentall, 1996) and the Attributional Style Questionnaire (ASQ; Peterson et al., 1982) but they have also been measured in other ways such as by coding the natural speech of participants (Craig et al., 2004). Included studies will be required to measure attributions in one of these ways or to employ a conceptually equivalent measure. Data from the IPASQ will be prioritised over data from other measures and data from the ASQ will be prioritised over data from measures other than the IPASQ, if a study contains more than one relevant attributional measure. Participants' self-ratings (rather than independent judges' ratings) regarding the extent to which their attributional statements represent an internalising attributional bias for positive events will be prioritised.

Secondary outcomes

None.

Data extraction, (selection and coding)

The first author (David Barker) will conduct the selection process for studies against the inclusion/exclusion criteria. The process of decision making will be recorded and documented so it can be checked with the research team. Data will then be independently extracted by two authors (David Barker and Philip Murphy) using a standard data collection form. Results will be compared and any inconsistencies will be resolved through discussion. Extracted data will include sample characteristics (e.g., gender, age, ethnicity, clinical diagnosis, stage of illness, sample source, and location), study design, measure/s of internalising attributional style, and outcome data (e.g., means, standard deviations, proportions, correlations, and regression weights where applicable). If data is not reported in usable format, an attempt will be made to derive effect sizes from other statistics (e.g., t

test values, P-values, F-values) using equations specified in the Cochrane Handbook or by Borenstein and colleagues. Data pertaining to certain groups will be prioritised. Specifically, if a study contains both a depressed persecutory delusion group and a non-depressed persecutory delusion group, the non-depressed persecutory delusion group will take precedence over the over the depressed persecutory delusion group for the relevant analysis. This will enable the removal of the potential confounding effect of depression from this analysis.

Risk of bias (quality) assessment

A methodological quality assessment tool for observational research, adapted from one used by the Agency for Healthcare Research and Quality (AHRQ; Williams, Plassman, Burke, Holsinger, & Benjamin, 2010) will be used. In addition, the GRADE approach will be used to provide an assessment of quality at the outcome level. The GRADE approach will be adapted so that observational studies will not automatically be marked down for quality. This is because all studies included in the proposed review will be observational. The reviewer carrying out the quality assessments will complete the GRADE online training (http://cebgrade.mcmaster.ca). Quality assessments will be presented descriptively to guide the interpretation of findings. In addition, specific aspects of methodology will be tested as moderators of effect sizes if there is sufficient data. These will include blinding and the matching of participants on demographics.

Strategy for data synthesis

Hedge's g will be used to determine effect sizes for group differences on continuous outcomes. Where studies have two or more relevant persecutory delusional groups (or two or more relevant control groups), these will be combined into a single weighted effect size. For the correlational analyses, Pearson's correlations will be converted into Fisher's Z. When Spearman's correlations are reported, these will firstly be converted into approximate Pearson's correlations. Fisher's Z estimates will then be back-transformed to Pearson's correlations to allow interpretation according to Cohen's (1988) conventions. Every effort will be made to transform any other reported data into usable metric, following procedures outlined in the Cochrane Handbook or by Borenstein and colleagues. For all effects, 95% confidence intervals will be calculated and statistical significance will be set at $P = 0.05$. If there is sufficient power, publication bias will be assessed through the Doi plot and LFX index, and, if publication bias is indicated, this will be adjusted for using the 'Trim and Fill' method. Heterogeneity will be assessed via the Q-statistic and quantified via the I^2 statistic. Random-effects meta-analyses will be undertaken as some degree of heterogeneity is expected across studies. Nonetheless, when there is less than moderate heterogeneity (i.e., I^2 statistic $< 40\%$), a sensitivity analysis will be carried out to examine the difference between fixed-effects and random-effects models. Where it is not possible to perform a meta-analyses because of limited studies, a narrative review will be undertaken of the studies identified.

Analysis of subgroups or subsets

Depending on statistical power, the following moderators of effect size will be examined:

1) Matching of groups on demographics

2) Group differences in depression

3) The stage of psychosis (early psychosis vs. chronic psychosis)

4) The blinding of the outcome assessor.

Meta-regression will be used to test these moderator effects. If data reporting allows, sensitivity analysis will be carried out to explore the impact of using independent judges' ratings rather than participants' self-ratings (regarding the extent to which attributional statements represent an internalising attributional bias for positive events).

Dissemination

Upon completion, the review will be submitted to a peer-reviewed journal for publication.

Contact details for further information

David Barker

NHS Lothian

The Orchard Clinic

Royal Edinburgh Hospital

Morningside Place

EH10 5HF

david.barker10@nhs.net

Organisational affiliation of the review

The University of Edinburgh

Review team

Mr David Barker, University of Edinburgh/NHS Lothian

Dr Paul Hutton, Edinburgh Napier University

Dr Emily Newman, University of Edinburgh

Dr Ethel Quayle, University of Edinburgh

Dr Louise Tansey, NHS Lothian

Dr Philip Murphy, Edinburgh Napier University

Anticipated or actual start date

27th November 2017

Anticipated completion date

1st May 2018

Funding sources/sponsors

Not applicable

Conflicts of interest

None known

Language

English

Country

Scotland

Stage of review

Ongoing

Date of registration in PROSPERO

30th November 2017

Stage of review at time of original submission	*Started*	*Completed*
Preliminary searches	Yes	No
Piloting of the study selection process	No	No
Formal screening of search results against eligibility criteria	No	No
Data extraction	No	No
Risk of bias (quality) assessment	No	No
Data analysis	No	No

Review information available at:
https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=78038

B. Search Strategy

A comprehensive systematic review of the literature was conducted following consultation with a research librarian and a member of the research team (PM).

A search of electronic databases (MEDLINE, PsycINFO, EMBASE, and Web of Science) from 1970, until 5th January 2018, was undertaken, using the following search terms:

(attribution bias* or attributional bias* or externalising bias* or externalizing bias* or internalising bias* or internalizing bias* or personalising bias* or personalizing bias* or self-serving bias*) AND (psychosis or psychotic or schizo* or delusion* or paranoi* or persecut*).

The reference lists of two relevant and comprehensive reviews (Garety and Freeman, 2013; Murphy et al., in preparation) were then collated and searched for any additional references. The reference lists of all full text articles were subsequently searched to identify any literature missed during the initial searches. When it was thought that relevant data had been collected but not reported, corresponding authors of the appropriate studies were contacted in an attempt to obtain unpublished data. Finally, all corresponding authors of included articles were contacted to seek out any further unpublished articles.

C. Excluded Studies

This table contains the studies that were excluded from the review after examination of the full-text. Articles that were excluded following a screening of the title or abstract are not recorded due to the quantity and irrelevance to the research topic/question.

Study	Reason for Exclusion
Achim, Sutliff, Samson, Montreuil, & Lecomte, 2016	Sample was not appropriate
An et al., 2010	No measure of internalising attributional bias
Bentall & Kaney, 1996	No measure of internalising attributional bias
Bentall & Kaney, 2005	No measure of internalising attributional bias
Bentall, Kaney, & Dewey, 1991	Cannot be used in analyses due to re-use of same sample/participants
Bentall et al., 2009	No measure of internalising attributional bias
Bottoms, Treichler, Davidson, & Spaulding, 2015	Sample was not appropriate
Brakoulias, Langdon, Sloss, Coltheart, Meares, & Harris, 2008	No measure of paranoia
Buck, Pinkham, Harvey, & Penn, 2016	No measure of internalising attributional bias
Cantero, Duque, Valiente, Fuentenebro, & Villavicencio, 2012	No full text available
Carlin, Gudjonsson, & Rutter, 2005	No measure of internalising attributional bias
Combs et al., 2009	Useable data not reported or provided by the author
Darrell-Berry, Bucci, Palmer-Claus, Emsley, Drake, & Berry, 2017	No measure of internalising attributional bias
Donohoe et al., 2008	Sample was not appropriate
Fiszdon et al., 2017	Cannot be used in analyses due to re-use of same sample/participants

Study	Reason for Exclusion
Fornells-Ambrojo, Craig, & Garety, 2013	No measure of paranoia
Fraguas, Mena, Franco, Martin-Blas, Nugent, Rodriguez-Solano, 2008	Useable data not reported or provided by the author
Harris, Oakley, Reichenberg, Murphy, & Picchioni, 2012	No full text available
Hasson-Ohayon, Mashiach-Eizenberg, Arnon-Ribenfeld, Kravetz, & Roe, 2017	Sample was not appropriate
Humphreys & Barrowclough, 2006	Useable data not reported or provided by the author
Janssen et al., 2006	Sample was not appropriate
Kaney & Bentall, 1992	No measure of internalising attributional bias
Kinderman, Kaney, Morley, & Bentall, 1992	Cannot be used in analyses due to re-use of same sample/participants
Krstev, Jackson, & Maude, 1999	Sample was not appropriate
Langdon, 2010	Useable data not reported or provided by the author
Langdon, Corner, McLaren, Ward, & Coltheart, 2006	Useable data not reported or provided by the author
Langdon, Still, Connors, Ward, & Catts, 2013	Useable data not reported or provided by the author
Marsh et al., 2016	Sample was not appropriate
Merrin, Kinderman, & Bentall, 2007	No measure of internalising attributional bias
Mizrahi, Addington, Remington, & Kapur, 2008	Useable data not reported or provided by the author
Moritz, Bentall, Kolbeck, & Roesch-Ely, 2017	Sample was not appropriate
Prieto, Quevedo-Blasco, & Buela-Casal, 2010	Text not available in English

Study	Reason for Exclusion
Prikken, van der Weiden, Kahn, Aarts, van Haren, 2018	Sample was not appropriate
Sanjuan, Fraguas, Magallares, Merchan-Naranjo, 2009	Sample was not appropriate
So, Tang, & Leung, 2015	Sample was not appropriate
Vazquez et al., 2006	Text not available in English
Wittorf et al., 2012	Useable data not reported or provided by the author

D. Data Extraction Hierarchy

The primary outcome measure was the degree to which positive events were attributed to oneself (i.e., internalising attributional bias). Data from the Internal, Personal, and Situational Attributions Questionnaire (IPSAQ; Kinderman and Bentall, 1996) were prioritised over data from other measures, and data from the Attributional Style Questionnaire (ASQ; Peterson et al., 1982) were prioritised over data from measures other than the IPSAQ, if a study contained more than one attributional measure.

The IPSAQ was prioritised as it has demonstrated greater reliability than the ASQ (Bentall et al., 2001).

Finally, participants' self-ratings, as opposed to independent judges' ratings, regarding the extent to which participants' attributional statements represented an internalising attributional bias, were given priority. Whilst discrepancies between self-ratings and judge-ratings have been observed in the literature (Martin & Penn, 2002) it is currently unclear which type of rating is more meaningful (Bentall et al., 2001). Since the IPSAQ and ASQ were designed as self-report measures, and in the absence of evidence demonstrating the validity of utilising judge-ratings, we decided to prioritise self-ratings.

E. Table summarising the characteristics of the 25 included studies

Study (Country)	Included participant groups (N)	Mean age (SD)	Gender	Measure of IAB for positive events
Aakre, 2009 (USA)	PDs (18) Non-paranoid psychosis (47) Healthy controls (29)	37.89 (10.82) 36.22 (8.68) 37.66 (7.98)	M = 66.7%, F = 33.3% M = 66%, F = 34% M = 65.5%, F = 34.5%	LACS
Berry, 2015 [a] (UK)	PDs (22) Healthy controls (25)	32.32 (9.25) 31.88 (11.54)	M = 68%, F = 32% M = 68%, F = 32%	IPSAQ
Candido, 1990 (CANADA)	PDs (15) Depression (15)	37.47 (11.89) 41.93 (11.63)	M = 80%, F = 20% M = 67%, F = 33%	ASQ
Davidson, 2017 [a] (USA)	Psychosis (51)	51.00 (9.00)	M = 58%, F = 42%	IPSAQ
Diez-Alegria, 2006 (SPAIN)	PDs (40) Non-paranoid psychosis (25) Depression (35) Healthy controls (36)	33.30 (8.40) 31.10 (4.90) 39.60 (12.20) 30.40 (7.40)	M = 68%, F = 32% M = 84%, F = 16% M = 26%, F = 74% M = 58%, F = 42%	IPSAQ
Fear, 1996 (UK)	PDs (20) Healthy controls (20)	Not reported Not reported	Not reported Not reported	ASQ
Fornells-Ambrojo, 2009 [a] (UK)	PDs (20) Depression (19) Healthy controls (32)	27.20 (7.90) 42.60 (9.50) 26.70 (5.30)	M = 90%, F = 10% M = 43%, F = 57% M = 81%, F = 19%	ARAT

Study (Country)	Included participant groups (N)	Mean age (SD)	Gender	Measure of IAB for positive events
Jolley, 2006 (UK)	PDs (14) Non-paranoid psychosis (34)	Total sample: 37.10 (9.30)	Total sample: M = 70%, F = 30%	ASQ
Kaney, 1989 (UK)	PDs (17) Depression (16) Healthy controls (17)	34.80 (13.33) 39.82 (16.35) 34.80 (13.64)	M = 65%, F = 35% M = 65%, F = 35% M = 65%, F = 35%	ASQ
Kinderman, 1997 (UK)	PDs (20) Depression (20) Healthy controls (20)	Not reported Not reported Not reported	M = 65%, F = 35% M = 75%, F = 25% M = 75%, F = 25%	IPSAQ
Lee, 2004 (UK)	PDs (12) Healthy controls (12)	46.82 (12.69) 43.17 (13.82)	M = 75%, F = 25% M = 75%, F = 25%	CAVE
Lincoln, 2010 [a] (GERMANY)	PDs (25) Non-paranoid psychosis (25) Healthy controls (70)	35.40 (11.80) 32.20 (9.70) 34.07 (11.63)	M = 56%, F = 44% M = 60%, F = 40% M = 60%, F = 40%	IPSAQ
Lyon, 1994 (UK)	PDs (14) Depression (14) Healthy controls (14)	35.60 (9.89) 40.90 (9.65) 35.70 (9.66)	M = 86%, F = 14% M = 86%, F = 14% M = 86%, F = 14%	ASQPF
Martin, 2002 (USA)	PDs (15) Non-paranoid psychosis (15) Healthy controls (16)	39.10 (8.70) 34.30 (10.20) 36.80 (9.60)	M = 53%, F = 47% M = 47%, F = 53% M = 47%, F = 53%	IPSAQ
McKay, 2005 (AUSTRALIA)	PDs (13) Non-paranoid psychosis (11) Healthy controls (19)	42.23 (9.78) 37.58 (10.98) 35.89 (11.71)	M = 54%, F = 46% M = 25%, F = 75% M = 37%, F = 63%	IPSAQ

Study (Country)	Included participant groups (N)	Mean age (SD)	Gender	Measure of IAB for positive events
Mehl, 2010 (GERMANY)	PDs (20)	34.61 (10.81)	M = 52%, F = 48%	IPSAQ
	Non-paranoid psychosis (16)	32.17 (10.68)	M = 61%, F = 39%	
	Healthy controls (21)	33.73 (10.28)	M = 50%, F = 50%	
Mehl, 2014 (GERMANY)	PDs (142)	37.75 (9.60)	M = 59%, F = 41%	IPSAQ-R
	Healthy controls (51)	35.77 (9.47)	M = 59%, F = 41%	
Melo, 2006 (UK)	PDs (35)	34.50 (11.31)	M = 75%, F = 25%	ASQ
	Healthy controls (20)	40.10 (14.20)	M = 76%, F = 24%	
Melo, 2013 (UK)	PDs (41)	37.36 (9.84)	M = 71%, F = 29%	SDEI
	Healthy controls (25)	36.52 (11.21)	M = 80%, F = 20%	
Menon, 2013 [a] (CANADA)	Psychosis (14)	40.57 (12.78)	M = 71%, F = 29%	IPSAQ
Moritz, 2007 (GERMANY)	PDs (35)	34.23 (9.29)	M = 54%, F = 46%	ASQ-B
	Depression (18)	39.83 (8.73)	M = 56%, F = 44%	
	Healthy controls (28)	33.50 (10.23)	M = 36%, F = 64%	
Randall, 2003 [a] (UK)	PDs (18)	34.89 (11.15)	M = 78%, F = 22%	IPSAQ
	Non-paranoid psychosis (14)	34.71 (10.28)	M = 57%, F = 43%	
	Healthy controls (18)	31.89 (8.53)	M = 61%, F = 39%	
Randjbar, 2011 (GERMANY)	PDs (10)	40.00 (15.33)	M = 80%, F = 20%	IPSAQ
	Non-paranoid psychosis (19)	39.47 (10.43)	M = 47%, F = 53%	
	Healthy controls (33)	33.97 (11.10)	M = 30%, F = 70%	

Study (Country)	Included participant groups (N)	Mean age (SD)	Gender	Measure of IAB for positive events
Sanford, 2017 [a] (CANADA)	PDs (10)	36.40 (8.85)	M = 60%, F = 40%	ASB
	Non-paranoid psychosis (31)	35.39 (9.61)	M = 65%, F = 35%	
	Healthy controls (58)	29.81 (8.85)	M = 52%, F = 48%	
Sharp, 1997 (UK)	PDs (19)	52.89 (14.33)	M = 42%, F = 58%	ASQ
	Non-paranoid psychosis (12)	44.00 (16.46)	M = 58%, F = 42%	
	Healthy controls (24)	42.88 (13.12)	M = 42%, F = 58%	

Terms: IAB = Internalising Attributional Bias (for positive events); PDs = Persecutory Delusions.

Attributional style measures: ARAT = Attributional style Achievement and Relationships Attributions Task; ASB = Attributional Style Bade Task; ASQ = Attributional Style Questionnaire; ASQ-B = ASQ modified by Brunstein; ASQpf = ASQ parallel form; CAVE = Content Analysis of Verbatim Explanations; IPSAQ = Internal, Personal, and Situational Attributions Questionnaire; IPSAQ-R = IPSAQ-Revised; LACS = Leeds Attributional Coding System; SDEI = Significant Daily Events Interview.

[a]Additional data was provided by the authors.

F. Data used for each meta-analysis

F.1. Difference in internalising attributional bias (IAB) between those with Persecutory Delusions (PDs) and Healthy Controls

	Paranoid Psychosis			Healthy Controls			
Author/study	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**Total N**
Aakre, 2009	18	28.47	17.00	29	21.61	12.49	47
Berry, 2015	22	4.64	1.71	25	4.28	1.84	47
Diez-Alegria, 2006	40	7.12	1.85	36	6.44	1.76	76
Fear, 1996	20	30.60	5.90	20	28.80	5.40	40
Fornells-Ambrojo, 2009	20	3.25	0.97	32	3.28	1.30	52
Kaney, 1989	17	32.80	5.30	17	29.90	5.30	34
Kinderman, 1997	20	8.75	2.81	20	7.00	2.51	40
Lee, 2004	12	0.67	0.78	12	1.45	0.93	24
Lincoln, 2010	25	10.60	3.52	70	11.27	2.54	95
Lyon, 1994	14	30.86	7.06	14	29.71	6.12	28
Martin, 2002	15	6.60	3.80	16	8.80	3.20	31
McKay, 2005	13	8.38	2.14	19	7.26	3.38	32
Mehl, 2010	20	10.76	3.17	21	11.67	2.83	41

	Paranoid Psychosis			Healthy Controls			
Author/study	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**Total N**
Mehl, 2014	142	52.54	14.39	51	54.50	13.69	193
Melo, 2006	35	30.03	5.02	20	30.45	3.52	55
Melo, 2013	41	5.10	2.04	25	3.84	2.12	66
Moritz, 2007	35	4.27	0.75	28	4.40	0.66	63
Randall, 2003	18	5.17	3.19	18	7.50	2.81	36
Randjbar, 2011	10	8.70	3.83	33	10.48	3.47	43
Sanford, 2017	10	7.49	2.82	58	6.86	1.61	68
Sharp, 1997	19	30.68	6.20	24	28.83	5.90	43

F.2. Difference in internalising attributional bias between those with Persecutory Delusions (PDs) and those with Non-Paranoid Psychosis

	Paranoid Psychosis			Non-Paranoid Psychosis			
Author/study	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**Total N**
Aakre, 2009	18	28.47	17.00	47	24.64	17.24	65
Diez-Alegria, 2006	40	7.12	1.85	25	6.68	1.86	65
Jolley, 2006	14	5.15	1.53	34	5.40	1.10	48
Lincoln, 2010	25	10.60	3.52	25	10.80	3.00	50
Martin, 2002	15	6.60	3.80	15	8.10	4.50	30
McKay, 2005	13	8.38	2.14	11	7.45	2.38	24
Mehl, 2010	20	10.76	3.17	16	10.63	3.32	36
Randall, 2003	18	5.17	3.19	14	7.57	2.95	32
Randjbar, 2011	10	8.70	3.83	19	9.89	2.77	29
Sanford, 2017	10	7.49	2.82	31	6.49	2.13	41
Sharp, 1997	19	30.68	6.20	12	31.92	5.20	31

F.3. Difference in internalising attributional bias (IAB) between those with Persecutory Delusions (PDs) and those with Depression

	Paranoid Psychosis			Depression			
Author/study	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**Total N**
Candido, 1990	15	6.42	0.66	15	3.97	0.85	30
Diez-Alegria, 2006	40	7.12	1.85	35	6.00	2.04	75
Fornells-Ambrojo, 2009	20	3.25	0.97	19	2.16	1.34	39
Kaney, 1989	17	32.80	5.30	16	28.70	5.30	33
Kinderman, 1997	20	8.75	2.81	20	9.15	3.23	40
Lyon, 1994	14	30.86	7.06	14	24.00	7.13	28
Moritz, 2007	35	4.27	0.75	18	4.18	0.91	53

F.4. Correlation between the magnitude of internalising attributional bias (IAB) and paranoia severity

Author/study	N	R
Aakre, 2009	65	0.10
Candido, 1990	45	0.47
Davidson, 2017	51	0.13
Diez-Alegria, 2006	65	0.11
Fear, 1996	29	-0.17
Jolley, 2006	48	-0.09
Lincoln, 2010	48	0.20
Martin, 2002	30	-0.18
McKay, 2005	24	0.20
Mehl, 2010	36	0.02
Menon, 2013	14	-0.11
Randall, 2003	32	-0.36
Randjbar, 2011	29	-0.20
Sanford, 2017	48	0.26
Sharp, 1997	31	-0.10

F.5. Difference in internalising attributional bias (IAB) between those with Psychosis with Persecutory Delusions (PDs) and Healthy Controls - Independent judge-ratings

	Paranoid Psychosis			Healthy Controls			
Author/study	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**Total N**
Martin, 2002	15	9.10	2.30	16	7.80	3.20	31
McKay, 2005	13	6.46	2.88	19	5.47	2.12	32
Randall, 2003	18	6.94	2.65	18	8.39	2.28	36
Randjbar, 2011	10	6.20	2.15	33	5.06	2.50	43

F.6. Difference in internalising attributional bias (IAB) between those with Psychosis with Persecutory Delusions (PDs) and those with Non-Paranoid Psychosis - Independent judge-ratings

	Paranoid Psychosis			Non-Paranoid Psychosis			
Author/study	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**Total N**
Martin, 2002	15	9.10	2.30	15	7.50	3.00	30
McKay, 2005	13	6.46	2.88	11	6.27	1.85	24
Randall, 2003	18	6.94	2.65	14	7.18	2.20	32
Randjbar, 2011	10	6.20	2.15	19	4.74	2.60	39

F.7. Correlation between the magnitude of internalising attributional bias (IAB) and paranoia severity – Independent judge-ratings

Author/study	N	R
Martin, 2002	30	0.29
McKay, 2005	24	0.04
Randall, 2003	32	-0.05
Randjbar, 2011	29	0.08

G. Study Quality Assessment Tool – AHRQ (taken from Murphy, Bentall, Freeman, O'Rourke, & Hutton, in preparation)

We used an adapted tool for assessing the methodological quality of observational studies that has been successfully employed in prior research undertaken by the Agency for Healthcare Research and Quality (AHRQ; Williams et al., 2010). The main methodological quality criteria were retained but the underlying factors related to each study quality criterion were adapted in some instances for this specific context. Each study is assessed on a number of methodological quality criteria (for example, unbiased selection of groups, sample-size calculations, and so on) that are rated as being met, not met, partially met, or being unclear.

Following the guidance of experts in the field of meta-analysis, we will avoid scale-based or aggregated study quality rating. Quality assessments were presented descriptively to guide the interpretation of findings, rather than used as a means to weight or adjust aggregated effect sizes. However, as noted, we planned to test whether specific aspects of methodology were moderators of effect sizes. These included blinding and the matching of participants on demographics.

The tool we used is reproduced below.

General instructions: Grade each criterion as 'Yes', 'No', 'Partially', or 'Can't tell'. Factors to consider when making an assessment are listed under each criterion. Where appropriate (particularly when assigning a 'No', 'Partially', or 'Can't tell' score), please provide a brief rationale for your decision (in parentheses) in the evidence table.

1. Unbiased selection of the cohort?

Factors that help reduce selection bias:

○ Inclusion/exclusion criteria:

○ Recruitment strategy:

- Clearly described
- Relatively free from bias (selection bias might be introduced, for example, by recruitment via advertisement).

2. Selection minimizes baseline differences in prognostic factors?

Factors to consider:

○ Was selection of the comparison group appropriate?

○ Is the comparison group matched with the clinical group on key demographics [age, gender, education (or IQ or a measure of intelligence if education is not reported), ethnicity]?

No = a standardised mean difference (d) of ≥ 0.3 on at least 2; Partial = d of ≥ 0.3 on 1; Yes = d of < 0.3 on 4 or 3 excluding ethnicity

3. Sample size calculated?

Factors to consider:

○ Did the authors report conducting a power analysis or describe some other basis for determining the adequacy of study group sizes for the primary outcome(s) of interest to us?

○ Where a power calculation is presented, do the final numbers obtained match up to this (for example, within 10% of required numbers)?

4. Adequate description of the cohort?

Consider whether the cohort is well-characterized in terms of baseline:

○ Age

○ Sex

○ Education

○ Ethnicity

○ Diagnosis/clinical status

No = reported 1 of the above or less; Partial = reported 2 to 4; Yes = reported all 5 or 4 excluding ethnicity

5. Validated method for ascertaining psychotic disorder?

Factors to consider:

○ Was the method used to ascertain exposure clearly described (details should be sufficient to permit replication in new studies)?

○ Was a valid and reliable measure used to ascertain exposure (subjective measures based on self-report tend to have lower reliability and validity than objective measures such as clinical interview)? Likewise, relying on medical notes is likely to introduce bias due to variation in how assessment is undertaken.

6. Validated method for ascertaining persecutory delusions or measuring paranoia/persecutory ideation?

Factors to consider:

○ Was the method used to ascertain exposure clearly described (details should be sufficient to permit replication in new studies)?

○ Was a valid and reliable measure used to ascertain exposure (subjective measures based on self-report tend to have lower reliability and validity than objective measures such as clinical interview)? Likewise, relying on medical notes is likely to introduce bias due to variation in how assessment is undertaken.

○ If appropriate, was the measure implemented consistently across all study participants?

7. Validated method for ascertaining depression (if relevant)?

○ Was the method used to ascertain exposure clearly described (details should be sufficient to permit replication in new studies)?

○ Was a valid and reliable measure used to ascertain exposure (subjective measures based on self-report tend to have lower reliability and validity than objective measures such as clinical interview)? Likewise, relying on medical notes is likely to introduce bias due to variation in how assessment is undertaken.

8. Validated method for ascertaining absence of diagnosis (if relevant)?

○ Was the method used to determine absence of diagnosis clearly described (details should be sufficient to permit replication in new studies)?

○ Was a valid and reliable measure used to ascertain exposure (subjective measures based on self-report tend to have lower reliability and validity than objective measures such as clinical interview)?

9. Validated method for measuring internalising attributional bias (if relevant)?

Factors to consider:

○ The IPSAQ, the ASQ or a conceptually equivalent variant should be used.

○ Was the measure implemented consistently across all study participants?

○ Did the measure meet minimal criteria for reliability/validity?

13. Outcome assessment blind to exposure?

Factors to consider:

○ Were the study investigators who assessed outcomes blind to whether participants had persecutory delusions and/or a psychotic disorder (this criterion will not apply in the case of Internet-based or automated designs where a researcher is not present)?

14. Adequate handling of missing data?

Factors to consider:

○ Are the details of missing data clearly reported, including how missing data was handled in the analyses? If not, is there any reason to believe missing data was present (for example, lower N in analysis than initially reported in the participants section).

○ Did missing data from any group exceed 20%?

○ If missing data was present and substantial, were steps taken to minimize bias (for example, sensitivity analysis or imputation).

H. GRADE Assessment Criteria (taken from Murphy, Bentall, Freeman, O'Rourke, & Hutton, in preparation)

All assessments were conducted by DB and cross-checked by PM. We applied the following criteria for downgrading to each outcome.

Study Limitations

Individual studies were rated for risk of bias/methodological quality using an adapted version of the Agency for Healthcare Research and Quality assessment tool (AHRQ) (Williams et al., 2010). We downgraded an outcome by 1 point if three of the parameters in our risk of bias assessment had ≥50% studies with at least one 'no' or 'unclear' rating, and 2 points if four or more parameters had ≥50% studies with ratings of 'no or unclear'.

Imprecision

We downgraded an outcome for imprecision by 1 point if *"a recommendation or clinical course of action would differ if the upper versus the lower boundary of the CI represented the truth"* and/or the number of events and sample size meant the optimal information size was not reached (Guyatt et al., 2011).

Inconsistency

We downgraded an outcome for inconsistency by 1 point if the I^2 statistic was ≥40% in the context of an unclear direction of effect or ≥75% in the context of a clear direction of effect. We downgraded by 2 points if the I^2 statistic was ≥75% in the context of an unclear direction of effect.

Publication Bias

We downgraded an outcome for publication bias by 1 point when, for outcomes with at least 10 studies (Higgins & Green, 2011), the Doi plot and LFK index suggested major asymmetry (i.e., LFK index >2) and this was not better explained by selective reporting bias or some other factor. However, if the 'trim and fill' method indicated that any publication bias was not likely to affect the overall magnitude of the effect size, we did not downgrade.

Rating Up the Quality of Evidence

In the context of a large effect size, we upgraded by 1 point where the effect size calculated was large. Using Cohen's criteria (1988), an effect size of $r \geq 0.50$ or $d \geq 0.80$ was considered large.

I. GRADE ratings and meta-analytic outcomes when independent judge-ratings were prioritised over self-ratings

Finding	Number of studies	Number of individuals with psychosis	Number of individuals in control group	Hedge's g, or r (95% CI)	Heterogeneity (I^2; 95% CI) (Chi^2 *P*)	Publication bias (LFK index)	GRADE quality rating	Moderator (N, *B*, SE, *P*)
Difference in IAB between those with psychosis with PDs and healthy controls	21	566	588	g = 0.13 (-0.03, 0.29)	37% (0 – 63) *P* = 0.05	-0.10	Moderate - Imprecision	MG[a]: N = 13; *B* = -0.06; SE = 0.20; *P* = 0.78 DEP: N = 10; *B* = 0.22; SE = 0.30; *P* = 0.47
Difference in IAB between those with psychosis with PDs and those with psychosis without PDs	11	202	249	g = 0.13 (-0.06, 0.32)	0% (0 – 39) *P* = 0.77	0.86	Moderate - Imprecision	MG[a]: N = 6; *B* = 0.33; SE = 0.24; *P* = 0.18
Correlation between magnitude of IAB and paranoia severity	15	595	——	r = 0.10 (0.01, 0.19)	16% (0 – 54) *P* = 0.28	-0.36	Moderate - Imprecision	

Finding	Number of studies	Number of individuals with psychosis	Number of individuals in control group	Hedge's g, or r (95% CI)	Heterogeneity (I^2; 95% CI) (Chi^2 *P*)	Publication bias (LFK index)	GRADE quality rating	Moderator (N, *B*, SE, *P*)

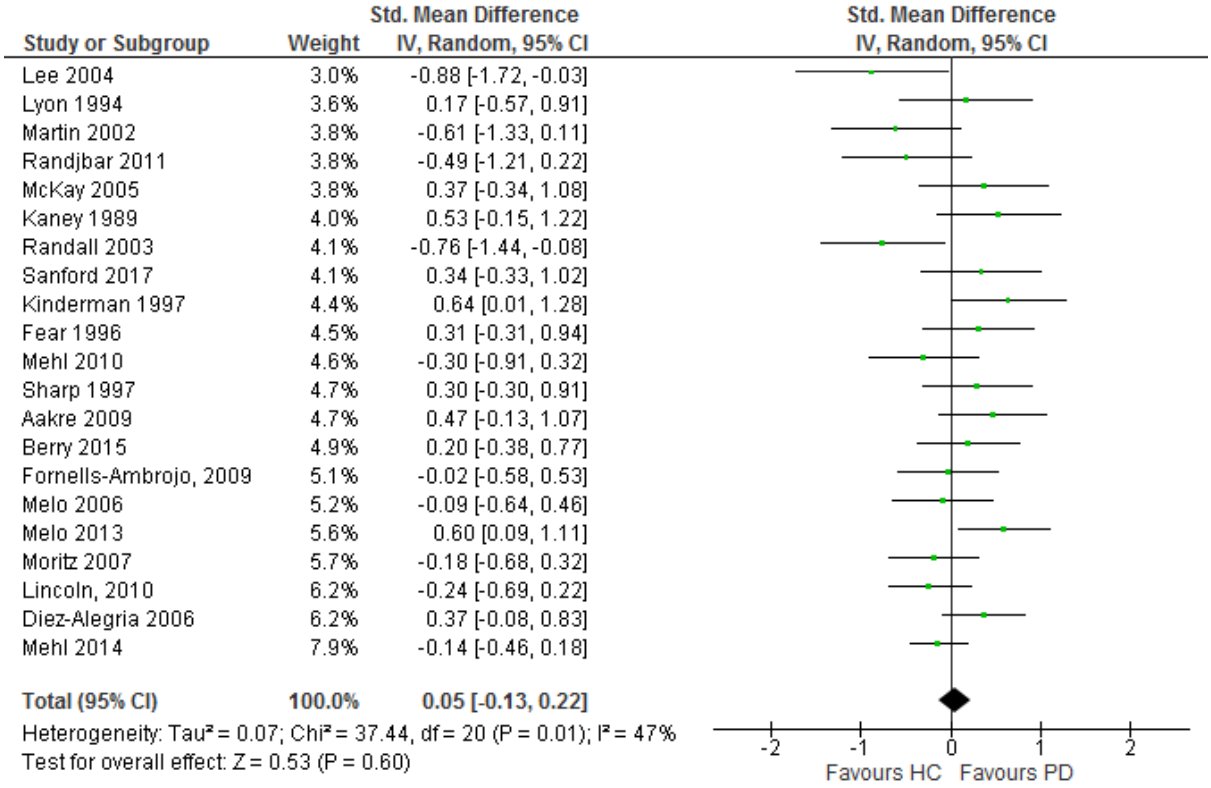
Terms: IAB = Internalising Attributional Bias (for positive events); PDs = Persecutory Delusions.
Moderators: MG = Matching of groups (a binary moderator where 1 = matched. N represents the number of studies where the moderator = 1); DEP = Depression (a continuous moderator measured using SMD, d).

[a]Additional data was provided by the authors.

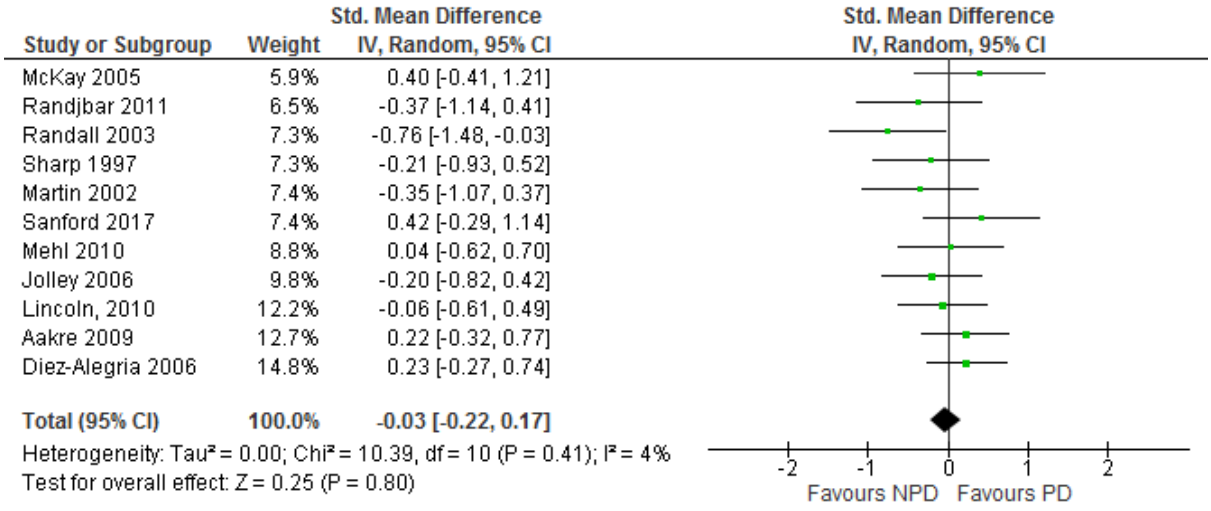
J. Forest plots of Meta-Analytic findings

Prioritisation of self-ratings

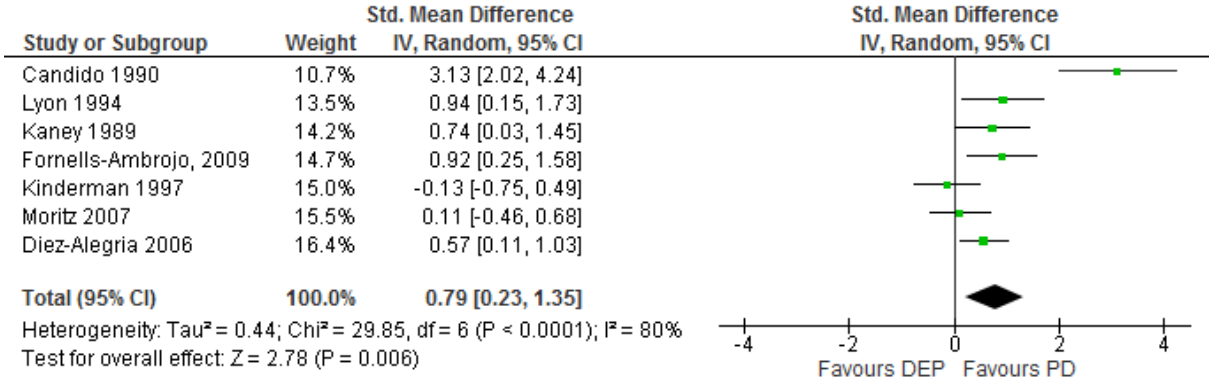
J.1. Difference in internalising attributional bias (IAB) between those with Persecutory Delusions (PDs) and Healthy Controls



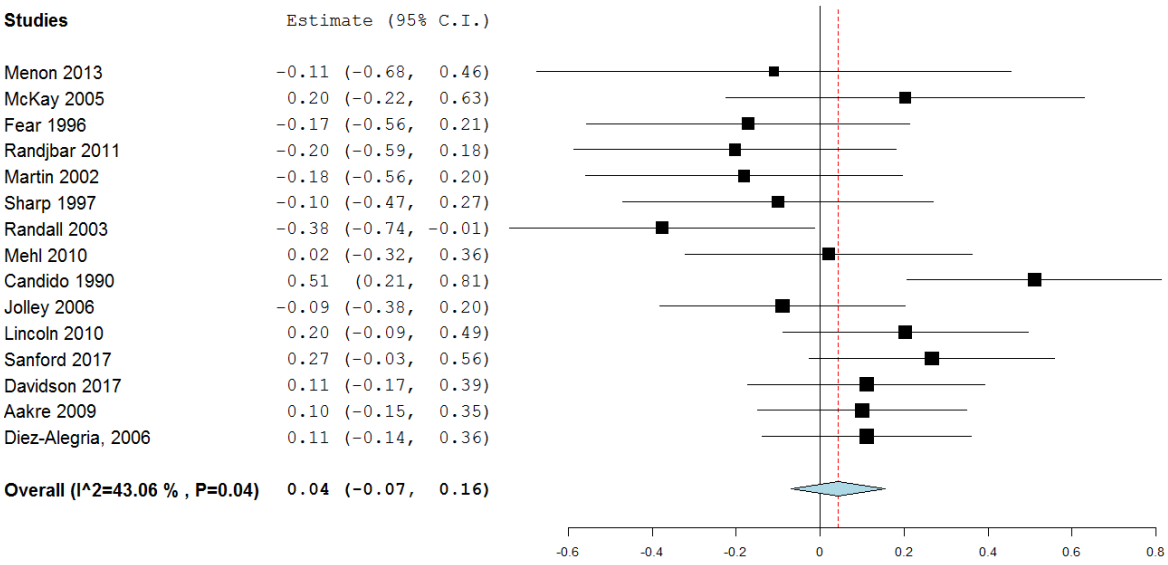
J.2. Difference in internalising attributional bias (IAB) between those with Persecutory Delusions (PDs) and those with Non-Paranoid Psychosis



J.3. Difference in internalising attributional bias (IAB) between those with Persecutory Delusions (PDs) and those with Depression



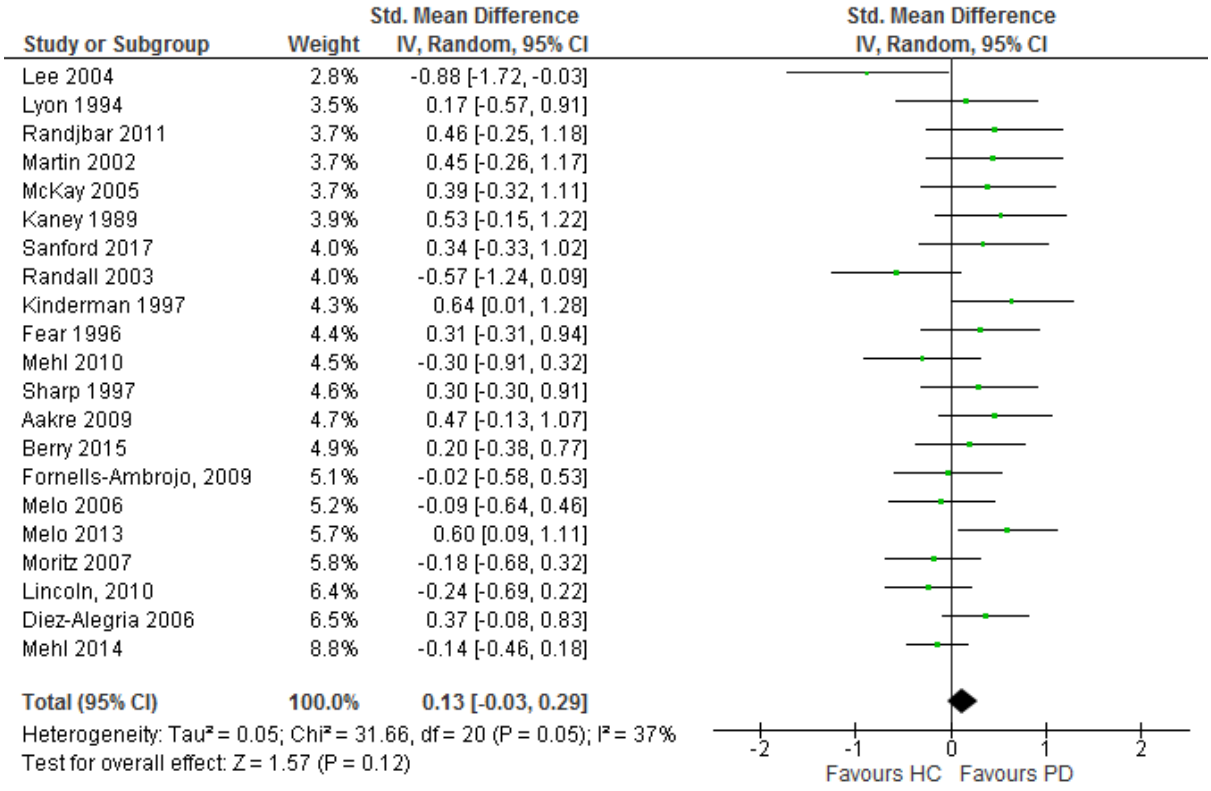
J.4. Correlation between the magnitude of internalising attributional bias (IAB) and paranoia severity



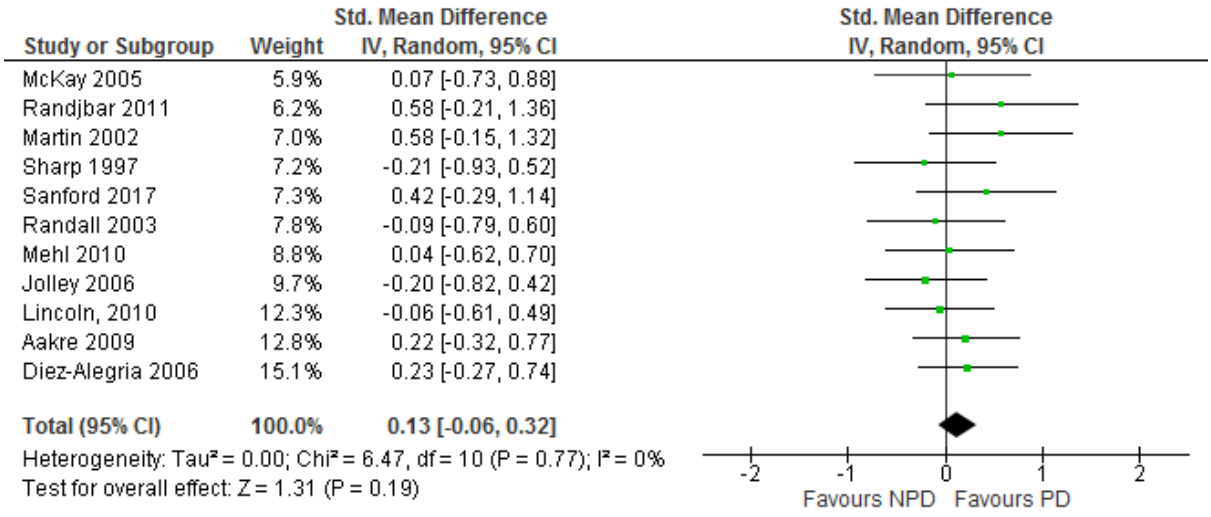
K. Forest plots of Meta-Analytic findings

Prioritisation of independent judge-ratings (IJR) over self-ratings (4 studies substituted)

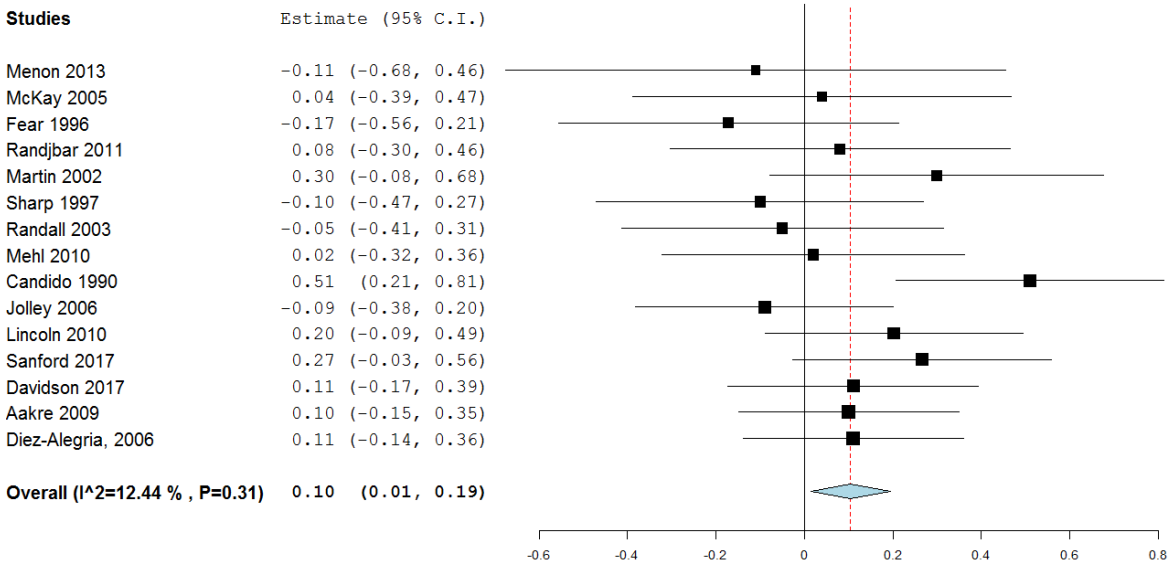
K.1. Difference in internalising attributional bias (IAB) between those with Persecutory Delusions (PDs) and Healthy Controls (IJR)



K.2. Difference in internalising attributional bias (IAB) between those with Persecutory Delusions (PDs) and those with Non-Paranoid Psychosis (IJR)



K.3. Correlation between the magnitude of internalising attributional bias (IAB) and paranoia severity (IJR)



L. *Clinical Psychology Review* author guidelines

Article structure

Manuscripts should be prepared according to the guidelines set forth in the Publication Manual of the American Psychological Association (6th ed., 2009). Of note, section headings should not be numbered.

Manuscripts should ordinarily not exceed 50 pages, including references and tabular material. Exceptions may be made with prior approval of the Editor in Chief. Manuscript length can often be managed through the judicious use of appendices. In general the References section should be limited to citations actually discussed in the text. References to articles solely included in meta-analyses should be included in an appendix, which will appear in the on line version of the paper but not in the print copy. Similarly, extensive Tables describing study characteristics, containing material published elsewhere, or presenting formulas and other technical material should also be included in an appendix. Authors can direct readers to the appendices in appropriate places in the text.

It is authors' responsibility to ensure their reviews are comprehensive and as up to date as possible (at least through the prior calendar year) so the data are still current at the time of publication. Authors are referred to the PRISMA Guidelines (http://www.prisma-statement.org/statement.htm) for guidance in conducting reviews and preparing manuscripts. Adherence to the Guidelines is not required, but is recommended to enhance quality of submissions and impact of published papers on the field.

Appendices

If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

Essential title page information

Title. Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible. Note: The title page should be the first page of the manuscript document indicating the author's names and affiliations and the corresponding author's complete contact information.

Author names and affiliations. Where the family name may be ambiguous (e.g., a double name), please indicate this clearly. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the

country name, and, if available, the e-mail address of each author within the cover letter.

Corresponding author. Clearly indicate who is willing to handle correspondence at all stages of refereeing and publication, also post-publication. Ensure that telephone and fax numbers (with country and area code) are provided in addition to the e-mail address and the complete postal address.

Present/permanent address. If an author has moved since the work described in the article was done, or was visiting at the time, a "Present address'" (or "Permanent address") may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

Abstract

A concise and factual abstract is required (not exceeding 200 words). This should be typed on a separate page following the title page. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separate from the article, so it must be able to stand alone. References should therefore be avoided, but if essential, they must be cited in full, without reference to the reference list.

Graphical abstract

Although a graphical abstract is optional, its use is encouraged as it draws more attention to the online article. The graphical abstract should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5 × 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. You can view Example Graphical Abstracts on our information site. Authors can make use of Elsevier's Illustration Services to ensure the best presentation of their images and in accordance with all technical requirements.

Highlights

Highlights are mandatory for this journal. They consist of a short collection of bullet points that convey the core findings of the article and should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point). You can view example Highlights on our information site.

Keywords

Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for

example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

Abbreviations

Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

Formatting of funding sources

List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, please include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Footnotes

Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors can build footnotes into the text, and this feature may be used. Otherwise, please indicate the position of footnotes in the text and list the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

Electronic artwork

General points

• Make sure you use uniform lettering and sizing of your original artwork.

• Embed the used fonts if the application provides that option.

• Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, or use fonts that look similar.

• Number the illustrations according to their sequence in the text.

• Use a logical naming convention for your artwork files.

• Provide captions to illustrations separately.

• Size the illustrations close to the desired dimensions of the published version.

• Submit each illustration as a separate file.

A detailed guide on electronic artwork is available.

You are urged to visit this site; some excerpts from the detailed information are given here.

Formats

If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format.

Regardless of the application used other than Microsoft Office, when your electronic artwork is finalized, please 'Save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below): EPS (or PDF): Vector drawings, embed all used fonts. TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi. TIFF (or JPEG): Bitmapped (pure black & white pixels) line drawings, keep to a minimum of 1000 dpi. TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale), keep to a minimum of 500 dpi.

Please do not:

• Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and limited set of colors;

• Supply files that are too low in resolution;

• Submit graphics that are disproportionately large for the content.

Color artwork

Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF), or MS Office files) and with the correct resolution. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) regardless of whether or not these illustrations are reproduced in color in the printed version. For color reproduction in print, you will receive information regarding the costs from Elsevier after receipt of your accepted article.

Please indicate your preference for color: in print or online only. Further information on the preparation of electronic artwork.

Figure captions

Ensure that each illustration has a caption. Supply captions separately, not attached to the figure. A caption should comprise a brief title (not on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

Tables

Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules and shading in table cells.

References

Citations in the text should follow the referencing style used by the American Psychological Association. You are referred to the Publication Manual of the American Psychological Association, Sixth Edition, ISBN 1-4338-0559-6, copies of which may be ordered from http://books.apa.org/books.cfm?id=4200067 or APA Order Dept., P.O.B. 2710, Hyattsville, MD 20784, USA or APA, 3 Henrietta Street, London, WC3E 8LU, UK. Details concerning this referencing style can also be found at http://humanities.byu.edu/linguistics/Henrichsen/APA/APA01.html

Citation in text

Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

Web references

As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.

Data references

This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

References in a special issue

Please ensure that the words 'this issue' are added to any references in the list (and any citations in the text) to other articles in the same Special Issue.

Reference management software

Most Elsevier journals have their reference template available in many of the most popular reference management software products. These include all products that support Citation Style Language styles, such as Mendeley and Zotero, as well as EndNote. Using the word processor plug-ins from these products, authors only need to select the appropriate journal template when preparing their article, after which citations and bibliographies will be automatically formatted in the journal's style. If no template is yet available for this journal, please follow the format of the sample references and citations as shown in this Guide.

Users of Mendeley Desktop can easily install the reference style for this journal by clicking the following link: http://open.mendeley.com/use-citation-style/clinical-psychology-review When preparing your manuscript, you will then be able to select this style using the Mendeley plugins for Microsoft Word or LibreOffice.

Reference style

References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters "a", "b", "c", etc., placed after the year of publication. References should be formatted with a hanging indent (i.e., the first line of each reference is flush left while the subsequent lines are indented).

Examples:

Reference to a journal publication: Van der Geer, J., Hanraads, J. A. J., & Lupton R. A. (2000). The art of writing a scientific article. Journal of Scientific Communications, 163, 51-59.

Reference to a book: Strunk, W., Jr., &White, E. B. (1979). The elements of style. (3rd ed.). New York: Macmillan, (Chapter 4).

Reference to a chapter in an edited book: Mettam, G. R., & Adams, L. B. (1994). How to prepare an electronic version of your article. In B.S. Jones, & R. Z. Smith (Eds.), Introduction to the electronic age (pp. 281-304). New York: E-Publishing Inc.

[dataset] Oguro, M., Imahiro, S., Saito, S., Nakashizuka, T. (2015). Mortality data for Japanese oak wilt disease and surrounding forest compositions. Mendeley Data, v1. http://dx.doi.org/10.17632/ xwj98nb39r.1

M. PRISMA Checklist

Section/topic	#	Checklist item	Reported
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	Yes
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	Yes
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	Yes
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	Yes
METHODS			

Section/topic	#	Checklist item	Reported
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	Yes
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	Yes
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	Yes
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Yes
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	Yes
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	Yes
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	Yes
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	Yes

Section/topic	#	Checklist item	Reported
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	Yes
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	Yes

Section/topic	#	Checklist item	Reported
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	Yes
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	Yes
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Yes
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Yes

Section/topic	#	Checklist item	Reported
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	Yes
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	Yes
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	Yes
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	Yes
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	Yes
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	Yes
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	Yes
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	Yes

Section/topic	#	Checklist item	Reported
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	N/A

Chapter 2: Empirical Study

Training forensic mental health nurses in Cognitive Analytic Therapy (CAT) principles: a qualitative exploration of the impact on complex case conceptualisation and implications for practice.

David Barker[1,2]*, Louise Tansey[2], Emily Newman[1], Ethel Quayle[1]

[1]Department of Clinical Psychology

School of Health in Social Science

University of Edinburgh

[2]The Orchard Clinic, Royal Edinburgh Hospital

NHS Lothian

*Corresponding author: David Barker, david.barker10@nhs.net

Written for publication in *Qualitative Health Research* - **Word count: 9,557**

Abstract

Forensic mental health nurses often work with complex individuals and face a number of challenges. Some of the difficulties can threaten their personal wellbeing and challenge team functioning in an inpatient setting. Cognitive Analytic Therapy (CAT) is a psychological approach which has been beneficial in addressing some of these issues in other areas of nursing. One such programme is the 'Cognitive Analytic Therapy (CAT): application to forensic settings' training hosted by a medium-secure clinic in NHS Scotland. We interviewed 10 forensic mental health nurses (60% female; mean age = 43.3) working in the clinic who had completed the training and analysed the transcripts using framework analysis. Nurses described the challenges of working in a forensic setting and how CAT training had facilitated greater self-reflection skills and improved their understanding of challenging patient behaviour. This knowledge transferred into positive adaptations to clinical practice.

Introduction

In the United Kingdom (UK), forensic inpatients are distributed between high, medium, and low, secure hospitals based on clinical need and level of risk (Royal College of Psychiatrists, 2016). The literature on clinical factors pertaining to forensic hospital admissions in the UK found that the typical patient in a medium-secure setting would have a primary diagnosis of schizophrenia, co-morbid substance misuse, and a history of serious violent offending (Kasmi, 2010). Other clinical factors include a history of sexually inappropriate behaviour, personality disorder, and self-harming behaviours (Coid, Kahtan, Cook, & Gault., 2001a; 2001b; Melzer et al. 2004).

High levels of emotional exhaustion and staff burnout have been reported amongst nurses working in acute mental health settings (Edwards & Burnard, 2003; Edward, Hercelinskyj, & Giandinoto, 2017; Johnson et al., 2011; Savicki & Cooley, 1989; Sherring & Knight, 2009). Such outcomes are particularly problematic as high stress levels and difficult working environments can lead to increased staff sickness rates and unfilled vacancies, potentially leading to greater service pressures within National Health Service (NHS) settings (Totman, Hundt, Wearn, Paul, & Johnson, 2011; Yanchus, Periard, & Osatuke, 2017). Moreover, nurses working closely with patients experiencing complex mental health problems, such as psychosis and personality disorders, can present with reduced patient empathy (Bodner et al., 2015; Wilkinson, Whittington, Perry, & Eames, 2017), poorer attitudes towards patients (Linden & Kavanagh, 2012; Markham, 2003), and more pessimistic views regarding prognosis/treatment outcomes (Ross & Goldner, 2009).

Whilst forensic mental health services experience many of the same issues as other acute mental health settings, forensic environments have been described as particularly challenging due to the staff team's perceived threats of violence from patients (Jacob & Holmes, 2011; Wilkinson et al., 2017) and exposure to more challenging mental health presentations (Beryl, Davies, & Vollm, 2018; Mason, Hall, Caulfied, & Melling, 2010). As an additional complicating factor, forensic psychiatric nurses hold multiple

roles and are required to consider a patient's mental health, physical wellbeing, and the effective management of risk to the public (Newman, Patterson, Eason, & Short, 2016). These multiple roles can be difficult to maintain, with research suggesting that nurses in forensic settings tend to prioritise risk management (Slemon, Jenkins, & Bungay, 2017) and are more punitive in response to patient aggression (Mason, Lovell, & Coyle, 2008). The nature of a patient's index offence (e.g. sex offence) has also been linked to negative staff perceptions of forensic inpatients (Harris, Happell, & Manias, 2015; Sandhu, Rose, Rosthill-Brookes, & Thrift, 2012). Factors contributing to nurses' negative attitudes and perceptions towards patients are important considerations for patient care in forensic settings as they are in conflict with the attitudes and responses deemed necessary to build a strong positive therapeutic relationship with a patient (Dziopa & Ahern, 2009). Since a positive relationship between nurse and patient is deemed to facilitate treatment completion, treatment success, and reduced recidivism in forensic populations (Serran & Marshall, 2010), it might be assumed that factors negatively affecting the quality of the relationship can lead to reductions in the overall quality of care, therefore increasing the risk of non-compliance and reoffending.

Research exploring patient-perspectives, suggest that the quality of the staff-patient relationship mediates feelings of trust in forensic mental health environments (MacInnes, Courtney, Flanagan, Bressington, & Beer, 2014). Moreover, it has been suggested that working with forensic patients can have broader service implications regarding the nursing team. For example, Beryl et al. (2018) suggested that such work can lead to nurse-team splitting and inconsistent care approaches. Given the assertion that consistency and clear boundaries are pivotal in creating a positive relationship between mental health nurse and patient (Dziopa & Ahern, 2009), the process of splitting could compromise team cohesion, thus, impacting upon patient care and relational security (Royal College of Psychiatrists, 2015). The multiple challenges faced by nurses in forensic settings are emphasised by the findings that moderate levels of stress and burnout are present in this population (Brown, Igoumenou, Mortlock, Gupta, & Das, 2017). However, Brown et al. (2017) noted that psychosocial interventions can help to successfully address this.

The concept of improving psychologically informed practice when working with complex presentations, such as personality disorder, has been supported by the National Offender Management Service in England (2015), and in a recent consensus statement by individuals diagnosed with a personality disorder (Lamb, Sibbald, & Stirzaker, 2018). In support of this, national guidelines in Scotland have focused on attempting to provide contextualised care in forensic environments to improve staff and patient wellbeing (The Forensic Matrix, 2011). This follows a surge of research activity exploring the benefits of psychological training, including psychoeducation and formulation with staff in community mental health teams (Kerr, 1999; Thompson, Donnison, Warnock-Parkes, Turpin, Turner, & Kerr, 2008), acute mental health wards (McCann & Bowers, 2005), and forensic mental health inpatient settings (Beryl & Vollm, 2018; Wilkinson et al., 2017). The reported benefits of psychological training include improved attitudes towards patients (Beryl & Vorm, 2018), greater magnitude of hopefulness regarding treatment outcomes (Chadwick, Williams, & Mackenzie, 2008), improved compassion and empathy for patients (McLeod, Deane, & Hogbin, 2002), more cohesive teamwork (Summers, 2006), and reduced burnout rates (Brown et al., 2018; Ewers, Bradshaw, McGovern, & Ewers, 2002). Indeed, various areas of forensic service provision have demonstrated the benefits of psychological training to better manage offenders. A pilot study by Bruce, Horgan, Kerr, Cullen, and Russell (2017) found that training probation staff working with personality disordered offenders in psychologically informed practice (PIP), resulted in significantly improved staff understanding of personality disorder and a greater sense of personal accomplishment compared to a control group. Moreover, staff issued significantly fewer warnings and there were fewer recalls to prison in the PIP group.

Despite positive findings, the variance of psychological approaches utilised, and methods of training employed, have resulted in some inconsistent findings. For example, Wilkinson et al. (2017) found that psychological formulation of case vignettes did not elicit greater levels of patient empathy in mental health nurses. The authors highlighted the need to consider how patient information is presented and

conveyed to staff, suggesting that studies reporting positive findings have been more interactive and realistic in their use of training/formulation. In addition, McCann and Bowers (2005) found that Cognitive Behavioural Therapy (CBT) training for psychiatric nurses working with psychosis in acute inpatient settings was not always effective, with leadership problems and staffing issues reported as plausible reasons. In light of these findings, offering a consistent therapeutic modality, providing staff-wide access to training, and embedding more realistic patient-scenarios within the training and learning, all appear to be important factors to consider.

Cognitive Analytic Therapy (CAT) training is a brief model that has presented with some success in this area. CAT is a psychological therapy that incorporates cognitive and psychodynamic concepts to make sense of patient difficulties (The Association for Cognitive Analytic Therapy; ACAT, 2018). It is user-friendly and operates on the premise that we are all in an interpersonal position in relation to another, and that these 'reciprocal roles' are changeable. It is assumed that most people would have a wide repertoire of reciprocal roles and ways of relating to others, whereas those with more abusive early experiences would have more limited, thus problematic, ways of relating to others (Kirkland & Baron, 2015). One of the benefits of CAT is that it allows challenging behaviours to be conceptualised as ineffective coping strategies as the patient attempts to escape feelings of distress, thus, potentially increasing compassion towards complex patients. Furthermore, CAT requires the nurse to consider their own role and responses in the context of the relationship and facilitates reflection around the function of challenging behaviour. CAT formulations are central to developing this understanding and have been successfully implemented with staff teams in forensic settings (Kemp, Bickerdike, & Bingham, 2017). CAT maps allow staff to externalise difficult patient interactions and can be a useful framework for acknowledging polarising views within a staff team. Whilst CAT is traditionally an individual therapy, which has demonstrated effectiveness for complex problems (Calvert & Kellett, 2014), it has also been successfully implemented as a brief training or formulative tool with mental health practitioners (Caruso et al., 2013; Dunn & Parry, 1997; Freshwaer & Kerr, 2006; Kellett, Wilbram, Davis, & Hardy, 2014; Kerr, 1999; Kerr, Dent-Brown, & Parry, 2007; Marshall et al., 2014; Thompson et al., 2008; Walsh, 1996).

Kemp et al. (2017) described the benefits of a structured CAT 'map-and-talk' approach in an NHS medium-secure forensic clinic. Essential to this model was the use of formulation with staff to help make sense of complex patient difficulties and the impact on the wider team. Furthermore, Kellett et al. (2014) described the organisational and team-working benefits of CAT consultancy in an NHS assertive outreach team. They reported that it specifically helped with team support and general team functioning allowing them to work more cohesively with a greater understanding of patients. Moreover, Kerr (1999) found that CAT was a useful model in helping educate staff in an NHS community mental health team working with a complex patient with Borderline Personality Disorder. A central feature of the research findings pertaining to applications of CAT training has been the role of CAT formulation in making sense of a patient's patterns of relating by exploring reciprocal roles. Thompson et al. (2008) suggested that the development of a shared language, through CAT skills training and formulation, facilitated team cohesion and improved team morale for those working with complex patients in an NHS community mental health team. Given the difficulties described for frontline nursing staff when working with complex patients, the notion of developing a 'shared language' via therapeutic milieus in forensic NHS services has been embedded in national guidelines (The Forensic Matrix, 2011).

One working example of this is the ongoing training programme 'Cognitive Analytic Therapy (CAT): application to forensic settings' hosted by a forensic medium-secure clinic in NHS Scotland. This is a 4-day programme and all members of staff working in the clinic are offered an opportunity to attend. In the context of a forensic setting, a nursing-perspective of the potential benefits of a CAT training programme has not yet been explored. Since forensic environments have been associated with higher levels of stress and burnout amongst nursing staff (Dickinson & Wright, 2008), and more negative perceptions of patients (Harris, Happell, & Manias, 2015), exploring this area could offer important clinical insights.

The primary aim of this research was to qualitatively explore the impact of a medium-secure clinic's brief CAT training on qualified nurses. Specifically, the impact of CAT training on nurse complex case conceptualisation, and implications for practice, were explored.

Method

Design

In this study, a purposive sample of mental health nursing staff working in a medium-secure forensic clinic was utilised. The aim was to recruit qualified mental health nurses who had completed the clinic's 4-day 'Cognitive Analytic Therapy (CAT): application to forensic settings' training. Framework Analysis was deemed the most suitable analysis as it utilises a more systematic approach to the interpretation of qualitative data whilst maintaining a degree of flexibility.

Ethical Considerations

Ethical approval for this study was obtained from NHS Lothian's Quality Improvement Team (QIT) and the University of Edinburgh's Clinical Psychology Research Ethics Committee (see supplement).

Inclusion/exclusion Criteria

Participants were eligible for inclusion in this study if they were a qualified and registered mental health nurse, worked in the medium-secure clinic, and had completed the clinic's 4-day introductory CAT training in the past 5 years.

Participants

10 registered mental health nurses took part in the study and completed a semi-structured interview with the primary researcher, DB. All interviews were recorded on an NHS digital device and were transcribed following completion. The length of the interview sessions ranged from 30-46 minutes (M=38.31 mins, SD=5.25).

Procedure

Potential participants were identified by the Psychology Department and had all completed the clinic's CAT training at some point in time over the past 5 years. Potential participants were then approached by DB who explained the purpose of the study and provided them with a participant information sheet and consent form (see supplement). After one week, if staff agreed to take part, they were asked to sign the consent form and an interview time was arranged. Interviews were audio-recorded and then transcribed in preparation for data analysis.

Development of the Interview Schedule

The creation of the interview schedule (see supplement) was guided by previous literature exploring the impact of CAT formulation training on mental health professionals' practice in an NHS setting (Kellett et al. 2014) and in consultation with two CAT-trained Psychologists in NHS Scotland. The schedule was then piloted with one participant to allow for further amendments. Some flexibility was employed during the interview, with questions being altered, or explored further, dependent on participant responses.

Data Analysis

Framework analysis was selected as the most appropriate method of data analysis for this study and is comprised of a matrix-based approach to organise predicted and emerging themes. It offers a viable means of qualitative analysis for interview data where there is a clear research question, a pre-defined sample population, and an existing theory surrounding the data (Srivastava & Thompson, 2009). Ritchie, Spencer, and O'Conner (2013) suggest distinct stages to framework analysis and document the need for an iterative process to allow the researcher to move between stages in order to strengthen the final themes.

Consistent with the suggested approach of Parkinson, Eatough, Holmes, Stapely, and Midgly (2016), our framework was derived from a combination of immersion in the data and the key areas of interest in our interview schedule. This allowed us to prepare an a priori framework which was then applied to the first transcript by DB, and an independent Clinical Psychologist familiar with framework analysis. Both coded the first transcript, by hand, and line-by-line, making notes of codes and which categories each chunk of text was relevant to. This process was reviewed, as were decisions about categories, allowing us to refine the framework and account for emerging issues in our data. This same process was then applied to 2 further transcripts, with the framework undergoing several iterations providing increasing clarity about how each category should be used. Some of the data was allocated multiple codes, however, there were some cases where it did not make sense to do this. As recommended by Parkinson et al. (2016), we took the option to utilise an 'other' code for data that could be relevant in refining our framework further. No framework is a perfect fit and this option allowed us to maintain flexibility with our framework in acknowledging emerging themes in our data at various stages.

All of the data was organised into the framework categories using the computerised data analysis program, Dedoose (http://www.dedoose.com/).

Methodological Robustness

The primary researcher also maintained a reflective diary during the interview process to demonstrate the decision process and theoretical ideas pertaining to key themes.

Results

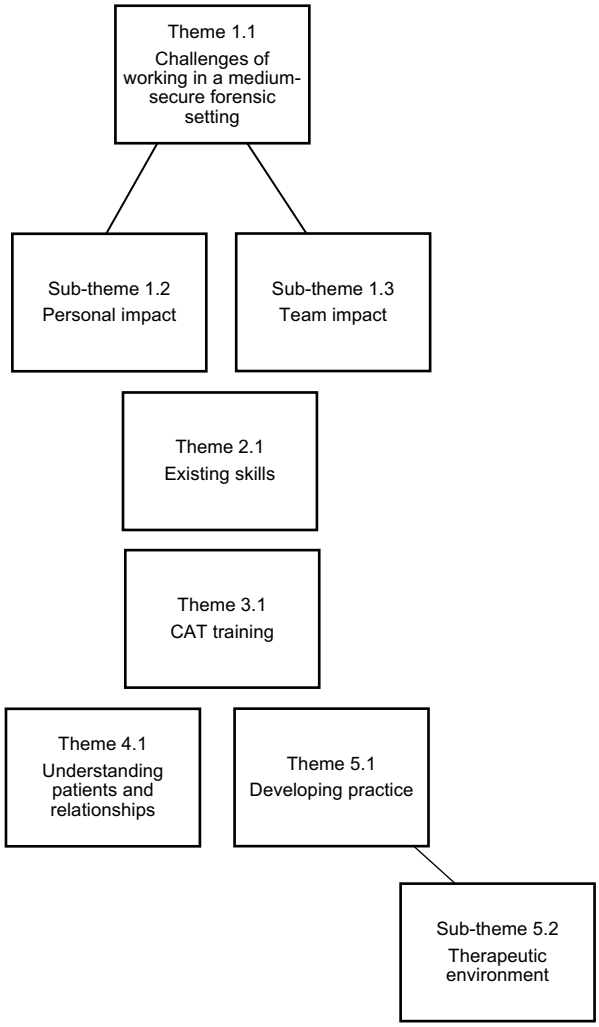
Demographic information

Four males and six females, aged between 30-57 years old (*M*=43.3 years, *SD*=9.53), were recruited to take part in the study. Years of experience ranged from 7-30 years (*M*=13.9 years, *SD*=7.80). One participant was from Germany and the remaining participants were from the United Kingdom. The average time elapsed since participants had completing the CAT training was 4.7 years (*SD*=4.21)

Framework

Five global themes and three subthemes emerged from the data as the framework underwent several iterations (see Fig.1). Whilst there is understandable overlap, the framework represents themes that were central to participants' experiences of the CAT training and its clinical implications.

Fig.1 Diagrammatic map of the analytical framework



Theme 1.1 Challenges of working in a medium-secure forensic setting

Reflected in this theme were the difficulties of working as a mental health nurse in a medium-secure forensic clinic. Participants frequently referred to *"dealing with the complexity of the patients"* as a particular challenge.

> *"They have challenging behaviours, they've maybe been in hospital a long time, they're unwell so that's a challenge. Challenging behaviours, antisocial behaviours, erm, so yeah, it is the challenge."*

Participants discussed how most patients had committed a violent offence in the context of their illness. The threat of verbal aggression and physical violence from patients was seen, by most participants, as a particular challenge of working in a forensic inpatient environment. Some of the challenges for nurses revolved, not around acute psychotic illnesses, but rather, longstanding personality traits resulting in what feels to be the manipulation of staff. This affected the way a patient interacted with staff and the wider system of care provided.

> *"Yeah, especially some of the individuals, they can be, err, quite, kinda, I hesitate to use the word manipulative, because that's just where they're coming from, but they can be seen as quite manipulative"*

Sub-theme 1.2 Personal Impact

All of the participants discussed how the challenges of their work had impacted on them personally. Specifically, they reflected on how working with certain patients brought out unhelpful reactions in them. In the face of verbal aggression from a patient, it seemed difficult for participants to manage their own emotions in the moment.

> *"You react to it, so, if someone's screaming and balling in your face, you do react to it, there's no way you can't not react to it. And the reaction that you bring to it depends on the individual, I mean, I've been in situations where I've reacted and then walked away and thought 'I really shouldn't have said that'."*

Some of the difficulties associated with personally maintaining a stable relationship with a patient stemmed from the patient's inconsistent emotions, behaviour, and interpersonal style. Nursing staff were sometimes personally subjected to abuse from these patients.

> *"One minute he would be speaking to you, and the next minute he was so angry and aggressive. I found that hard".*

As part of the pattern of unpredictable aggression and unstable relationships, some patients rejected participants' attempts to provide nursing care. Participants expressed a frustration and sense of hopelessness, noting that they can sometimes be *"seen as the enemy".*

> *"The emotion boils up and you think 'wait a minute, I've worked my arse off with you and I've done this, I've done that and I've, kinda, tried to help and you've just rammed everything back in my face'."*

At times, participants described feeling like they were *"effectively being abused"* in their relationships with patients. Whilst it was acknowledged that these experiences could leave them feeling "*pretty crap"*, for some, the constant abuse resulted in more extreme feelings of intense anger.

> *"I had to confront feelings in me which I never probably thought I had. Feelings of intense anger, near enough hatred, and I didn't think I could feel that. Also, feelings of helplessness, of disappointment, erm, feeling burnout".*

Participants also talked about the various ways in which working in such a challenging environment "*can be traumatising"*. The process of emotionally dealing with violent

offences and abusive patient histories was discussed. One participant explained how she felt blamed by a patient following an incident of self-harm.

> *"There's actual self-harm with specific blaming of you. Like, I've done this cut on my arm because of you".*

Sub-theme 1.3 Team impact

Alongside the personal impact of their work, all participants discussed the challenges associated with team working when working with complex patients. Participants described how particular patients, with certain personality traits, would draw out different responses from different staff members, sometimes leading to team conflict. It was noted that when working with forensic patients, there was always a *"risk of teams splitting"*.

> *"The staff team was completely split, it wasn't even just split down the middle, there were splinter groups. Everybody had different opinions, although most of them probably quite negative towards this patient."*

A key characteristic of team splitting appeared to be the concept of some staff being favoured, with others being disliked. Participants talked about the patients' *"ability to polarise staff"* and the difficulties for both sides within the team. Whilst disliked staff members could be subjected to verbal abuse, there was an acknowledgement that being a favoured member of staff for a patient was a very difficult role.

It was acknowledged that the care provided to more complex patients was inconsistent at times. Participants felt that this was due to psychological processes, such as splitting, as it had a *"dreadful effect on the team"*.

> *"No one could really agree on any sort of management for him at all. Erm, care plans, err, were practically written on a daily basis because they were never adhered to properly. Sometimes because of his behaviour, sometimes because of staff."*

> *"You can sometimes feel as though you're banging your head off a wall, because, you'll go off for days off, and come back, and you're right back at square one again because the team that has been on hasn't had the same way of working."*

Disputes within the team, regarding staff attitudes, and approaches to patient care, were frequently discussed. One participant described that conflict with other members of staff in the team *"almost cost me my mental health"*. The systemic challenges of working in a medium-secure forensic setting appeared to lead to greater levels of stress. Participants discussed how they had witnessed the impact this had on colleagues in their team.

> *"Staff have gone off sick, staff have been stressed. Erm, and we, kind of, sometimes have to take that home with us because we are not always the best at having, you know, looking after ourselves."*

Theme 2.1 Existing skills and strategies

As professionals working in a challenging setting, participants talked about the existing skills they use to try and manage the difficult work environment. More experienced nurses made reference to their clinical experience and the amount of time they have worked in mental health. They reflected that they don't perceive patients as challenging *"because I've dealt with it a long time"*. They talked about how they believe that their experiences have made them more resilient to the challenges faced in the complex forensic environment.

> *"I've worked in mental health since I left school. So, I don't know what it is, but something, obviously I've always been quite resilient and managed to carry on all of these years."*

Nurses also described having access to a support structure which they used to various degrees. This included supervision, peer groups, and more psychologically informed

approaches, such as mindfulness. Other members of staff explained that they have specifically developed psychologically-informed practice and that this helps them manage how they feel in work. One participant described developing skills in mindfulness over many years.

> *"I suppose mindfulness is my main tool, if you like. I've practised mindfulness, which I've done for several years."*

Theme 3.1 Cognitive Analytic Therapy (CAT) training

This theme reflected participant expectations and experiences of the CAT training. When the training was made available for staff in the clinic, most participants were encouraged to attend by their manger. Whilst places were directed at those who had expressed an interest, participants did describe how their managers supported and approved of them attending training.

> *"Our charge nurse encouraged us to go so the training. It was quietly advertised, so, I just, you know, put my name down."*

> *"I was in Cedar at the time and it was my line manager who put me forward for it."*

Participants had expectations that the CAT training would help them to develop a greater knowledge of CAT and how it can be applied to create a shared understanding of patient difficulties (formulation).

For those participants more familiar with the basic concepts of CAT, they hoped to use the training to develop a *"deepening understanding of patients"*. They discussed developing new ways of thinking in order to make sense of the relationships that patients get into. It was felt that this would lead them to understand why patients behave the way they do, particularly with personality disordered patients.

> *"A new way of thinking really, I suppose it's more about broadening my way of thinking, so I have a better understanding of the client group I work with and why they do what they do."*

> *"I could see, from what I heard about CAT training, that this might be something that might help me understand a bit more about working with people with personality disorder."*

Following training, participants reflected on the simplicity of the CAT approach in terms of making sense of patient relationships and interactions. There was an appreciation that CAT concepts could *"simplify relationships"* which appealed to participants.

Part of the simplicity of the CAT approach was the concept of reciprocal roles, and how they applied to the interactions with challenging patients. This seemed to be an important learning point for participants.

> *"Insight into the kind of roles patients play internally for themselves and then interactions with other people. And how staff, and anybody else who interacts with the patient, they can be manoeuvred, if you like, into playing a particular role."*

One participant felt that CAT training was particularly useful as the CAT-approach can help bring people together with neither side being *"right or wrong"*.

Some participants discussed the method of delivery for CAT training. Whilst reciprocal roles were seen as simplifying complex relationships, some participants were left feeling that the theoretical elements were too dense and *"it was quite hard to follow bits of it"*. This ultimately led to refinements in the training and was acknowledged by one participant.

Others discussed how training delivery method helped them to learn. Interactive teaching methods, the use of role plays, and applying CAT to genuine case examples, were all highlighted as beneficial.

> *"A lot of people hate role play, but I love it. So I, like, really enjoyed putting these skills to the test and, like, doing that sort of stuff."*

> *"When you start using case studies or scenarios, or talking about people and their behaviour, that's when you, kind of, learn, isn't it?! Their behaviours and why they continue in the same pattern."*

Theme 4.1 Understanding patients and relationships

This theme reflected participants' discussions of how their learning from the CAT training had shifted into better conceptualising patient interactions. Some participants described how psychologically-informed training had challenged their view of patient care based on their original training as a mental health nurse.

> *"Its brought me over to that side of biopsychosocial model, erm, and I think that helps with dealing with difficult people because it means you're totally getting it, why they've come to be where they are."*

Participants acknowledged a greater comprehension of patient relationships, making sense of difficult interpersonal styles. Central to this was the idea that a patient's challenging behaviour was not always just a *"mad defiance of the rules"*, but instead a way of alleviating their own distress.

One of the *"lightbulb moments"* for participants, and something others found *"fascinating"*, was the concept of reciprocal roles in helping them to make sense of complex patient presentations. Specifically, the underlying motivation for patients to behave in certain ways had helped participants to better understand their patients.

"CAT gave me an understanding of the roles people get into and why they react the way they do in certain situations; it's because of situations they've been in in the past. And it's a constant cycle for them and they're not quite sure how to get out of it, or where to go."

"CAT was a really valuable source of information for me, it just, to simply say 'oh I'm in this role now, so that probably means that she is in this role' and, you know, when you work with someone so much, it becomes easier in that way actually. So I found CAT training very helpful."

"The reciprocal roles thing, and I do think that was a bit of a lightbulb moment in my understanding of where patients were coming from. I don't think I would have had otherwise from not doing the CAT training."

In making sense of challenging patient presentations, participants demonstrated a deeper understanding of the concept that patients switch roles in an attempt to place themselves in a more comfortable emotional position. This facilitated a greater appreciation of why complex patients experience instability in relationships, exhibit troublesome behaviour, and engage in unpleasant interactions with another person in a relationship. Implicit in these discussions was the notion that a patient can be the victim one moment, but in an abusing position the next.

"Because if she's feeling down here (gestures low down), clearly she's uncomfortable with that and she doesn't have this middle ground to resort to. So, all she can do is flip it up to this point (gestures up high) and put you down there."

When acknowledging the switching of reciprocal roles, and the presentation of challenging behaviours from patients, participants discussed how CAT training had helped them understand that some patients are, emotionally speaking, in *"constant pain"*. They described an understanding that, despite a patient being verbally abusive towards them, the patient is also in a distressing emotional situation and that nurse and patient are left *"feeling as bad as each other"*.

The concept of reciprocal roles in understanding difficult patient presentations brought about discussions of how the patients that participants work with tend to have a more limited repertoire of reciprocal roles when compared to the general population. This knowledge helped participants to see why patients often engage in repetitive *"destructive patterns of behaviour"*.

> *"Some of the patients we work with only have one or two roles and I found that really that made a lot of sense to me. It made sense in terms of why they would always behave in the same way."*

Participants discussed how CAT training had helped them develop an understanding of some of the more confusing aspects of personality. Specifically, making sense of why a patient may seek out care, but then *"push you away"* due to difficulties with trust and closeness.

Following CAT training, participants reflected that they had developed an increased awareness of their own contribution to their relationships with patients. It was acknowledged that, whilst pushing a challenging patient back into a certain role during conflict is the *"easy thing to do"*, self-awareness and self-reflection in interactions were skills that could help build more positive relationships with patients.

> *"I think that's the thing CAT has, maybe, given me, more responsibility for my own, for being aware of how I come across and how other people can pick that up. And actually, the smallest thing, it might be the smallest thing to me, but, actually, if that means something to someone else..."*

> *"I remember in the training, they were saying because of what we bring to the relationship, you know, this is actually where the change can happen. Because of our relationship with that person, and that's really hopeful isn't it?"*

Consideration of the patient's history, their limited set of reciprocal roles, and the participants own interactions within the dynamic, helped them to take challenging behaviours from a patient less personally. This was emphasised by participants'

reflections that patients don't *"have it in for you"*, but rather, they're distressed and only have limited ways of coping.

> *"I think doing the CAT training helped me understand that, like, yes, they are shouting at me, but it's not personal. And it made me feel a lot better about taking flak from the patients, because it was like misdirected anger."*

Participants discussed how their understanding of complex patient presentations evoked greater levels of empathy and compassion, as they learned to understand the patient's *"history of trauma and their core pain"*. One participant explained that his understanding of the patient leads him to be *"less judgemental"*, where another expressed that *"you can see why people do certain offences"*.

> *"I think CAT training and seeing why they're still behaving like this after all these years, does, kind of, then you can come back and say, 'I can understand that and have a bit of empathy and compassion'."*

> *"I think in general, for me, I do have a bit more empathy towards people. Erm, and I'd say more compassion as well, and understanding that we only have a limited set number of roles that can function effectively."*

Overall, participants felt that developing a better understanding facilitated better relationships with their patients. This included bringing in some of their self-awareness to understand the differing roles between nurse and patient.

> *"It helps build a more positive relationship, doesn't it?! Because once you've learned the patient's background, you can maybe understand bits, or understand why they behaved in that way, to a certain degree. So CAT does help with the relationship, definitely, it gives a more positive relationship when you've got a better understanding of why they're behaving like that."*

Participants felt that the process of understanding patient relationships was transferrable to the team. They reflected that CAT training had positively impacted upon their ability to understand patients as a nursing team in the clinic. Regarding challenging patient behaviours, one the key issues discussed was how training *"raises awareness across the whole staff team"*.

> *"I think its really contributed to the whole unit. I mean, err, from what I can see, patients are more understood and therefore less judged."*

Theme 5.1 Developing clinical practice

This theme reflected participant discussions regarding a shift from CAT knowledge and understanding, to impacting on their clinical practice. They talked about how CAT training provided them with a platform to further develop their self-refection skills. The general message from participants was that *"CAT training does make you think about what you did and how you did it."*

> *"When I feel myself getting riled about something, I think 'ok, what role am I in here and why is that? And what does that mean about the other person?' so that CAT framework is just, it's great, it really is, I find it really helpful."*

> *"If someone rejects you, it's, I think I've reflected a bit more on that. I've went away and thought 'have I maybe been a bit dismissive of them and that's why this is happening?' I think it has made me a more reflective person."*

Reflection was also discussed in the context of talking with fellow nurses. Participants made reference to the value of using CAT to talk therapeutically with *"like-minded colleagues"* and how this promoted further self-reflections.

The consensus amongst participants was that exposure to difficult patients, and improved self-reflection skills, were both necessary in order to facilitate a shift towards changing their clinical approach with patients.

"We can use CAT training and think about the reflective side of it. Ok, this is the way they are, and this has happened, but I'm learning from that, and, next time, I'll notice if that's happening, and I'll spot the triggers and feelings in me. I'll spot that quicker, so, hopefully, using reflective side of it and think what I would do it differently in future."

One of the key areas of change that participants highlighted in their direct work with patients was communication. They described how they were willing to communicate with the patient in new ways since completing CAT training. Self-disclosing internal reflections, and asking patients questions to identify reciprocal roles, formed part of a more open communicative style.

"I've got no problems going back to someone and saying, 'look I've had a think about that and I'm actually really sorry for what happened yesterday, because I've realised this is maybe why…'. So, I probably wouldn't do that without CAT training because I probably wouldn't realise what I had done."

Sharing of CAT knowledge and formulations with patients helped nurses *"to communicate with a patient"* in clinical practice. This provided an opportunity for nurse and patient to generate insight through a shared-language, helping the patient to feel understood.

There were other practical elements to applying CAT knowledge and theory to patients which didn't directly involve discussing it. These consisted of participants changing their relational style within the dynamic *"more deliberately"* than before the CAT training. It was explained that this would *"allow the other person to do something different*".

"I am sometimes deliberately choosing a certain way of being, if you like, in order to allow the other person to do something different. You know, I'm very aware of the roles I take on."

Others discussed how their knowledge of CAT, and the concept of reciprocal roles, had directly guided clinical care with patients. One participant provided an example which centred around staff trying to *"lessen seclusion"* with a particular patient. The team changed their practice as seclusion of this individual often resulted in the patient perceiving that they were being bullied, which led him to then bully others on the ward.

> *"We don't want him to then go, you know, feel he is being bullied, so then he starts bullying other people, you know, we don't want to get into that."*

In terms of managing patients differently, participants discussed how CAT training helped create a more consistent care approach within the team. Specifically, they talked about how CAT can guide interventions for challenging patients by *"informing the way we work with them"*.

> *"As a team, we'd talk about his thought processes, what role he'd be in, the need for him, and how he'd start to behave in challenging ways based on that. And then how he'd approach staff, how staff reacted to him, and how he reacted back again, and then how he took our response, it's all there, people could see it."*

In situations where the use of seclusion for challenging behaviour was necessary, consistent team approaches allowed for individualised changes to a person's care based on CAT theory and reciprocal roles. One patient was described as experiencing an *"abandoning and being abandoned"* reciprocal role, whereby the process of being secluded reinforced the abandoned feeling. CAT training allowed staff to alter their approach when working with this individual.

> *"So, we have kind of learned to be like, 'ok, we would ask you to stay in your room, but I'm going to stand at the door. I'm here, you can shout and rant and rave and that's great, but I'm going to be here. And I'm not going to abandon you'."*

For others, it was about using seclusion when necessary, but in a less punitive way based on the team's CAT knowledge and understanding.

> *"Usually, if somebody was secluded, they certainly wouldn't get out the next day. But we did let that person out the next day, because it was for, you knew exactly where it was coming from, and you knew what the behaviour was trying to achieve and why."*

Overall, when reflecting on using CAT approaches with patients, participants felt that it had helped them to build more positive relationships with patients. They believed that this was something their colleagues could learn from and they discussed educating fellow colleagues on CAT-based approaches through conversation, case examples, and dissemination. They felt that this could help provide consistency within the team by ensuring that *"everybody works the same kind of way"*.

> *"You're disseminating to new colleagues, so they understand where things are coming from. So, I suppose CAT training just changed the way I tend to work with my colleagues and explain myself and explain how I do things."*

Sub-theme 5.2 The therapeutic environment

The CAT training was implemented in a wider context of CAT approaches utilised within the forensic inpatient setting. Participants discussed how 'CAT chats' (a 'map and talk' formulation) on the wards were useful opportunities for them to learn more about CAT, think about how CAT applies to their patient group, and help inform the wider team.

Participants reflected that the 'CAT chats' on the ward provided an important opportunity for those having completed CAT training to take their learning and start *"applying that to people"*.

> *"I was able to think in that, sort of, reciprocal role kind of way, because, following on the CAT training, we used to do CAT chats on the ward."*

Through developing a greater team understanding of patient behaviour through CAT training and CAT chats, there was a sense that the nursing team could feel more supported and validated.

> *"Acknowledging staff feelings and concerns, I think CAT helps with that. Cause we can take what you're feeling and map it to the relationship and say 'did you feel this in this situation?' 'Yeah, I did', well, we can see why that is. And they're like 'ok, it's not just me, we all feel like that in this situation'."*

> *"I think that's quite good for staff to have the opportunity, professionally, to look and say 'I feel quite vulnerable' or, you know, 'I do get angry'. It doesn't mean you're going to shout back or do anything, but the emotions are there and it's okay for people, for staff, to actually say and share. I think that's what I found was good about CAT."*

Table 1. Summary of analytic framework findings

Theme	Summary of key findings
1.1 The challenges of working in a forensic setting	Verbal abuse, and the threat of physical violence, posed a significant challenge for staff trying to engage patients. In discussing their own feelings and reactions, participants described the patient's unstable relationships, driven by inconsistent emotions and interpersonal style, as having a personal impact on them. Nurses described team splitting, with some patients favouring some staff, whilst intensely disliking others. This had led to inconsistent care approaches, conflict with colleagues, and stress amongst those in the nursing team.
2.1 Existing skills and strategies	Participants discussed how clinical experience was a resilience factor when working in such a difficult environment. A range of supportive tools were available to nurses including peer support, supervision, and mindfulness. These were things that helped them to cope with the personal stress of the work environment.
3.1 CAT training	Participants in this study described a high level of managerial support to attend CAT training. Nurses described skill-practice role plays, case videos, and applying CAT concepts to genuine complex patients, were all conducive to learning on the CAT training.
4.1 Understanding patients and relationships	The concept of reciprocal role procedures appeared to be an appealing concept. This was key for participants in facilitating a deeper understanding of patients and their challenging counterintuitive behaviours. Participants described having a better understanding of key CAT concepts including the switching of reciprocal roles to alleviate distress, the limited repertoire of reciprocal roles available to patients, and their repetitive destructive patterns of behaviour. Participants discussed feeling that verbal attacks were less personal following CAT training, this led them to have more compassion and empathy towards their patients.
5.1 Developing practice	Participants discussed how self-reflection had facilitated a shift towards more honest and open communication with patients. Nurses in this study described being more understanding, showing greater levels of empathy, communicating with patients differently, and working more consistently. They described how CAT informed the way they worked with some patients as a team, indicating that they were less likely to be punitive with the use of seclusion, and how acknowledgement of reciprocal roles had resulted in treating particular patients differently to avoid feeding into the patient's core fears.

Discussion

This study explored forensic mental health nurses' experiences of a CAT principles training programme, in terms of conceptualising complex patients, and the implications for clinical practice. Framework analysis revealed five primary themes: The challenges of working a medium-secure forensic setting; existing skills and strategies; CAT training; understanding patients and relationships; developing practice.

Consistent with literature, the findings from this study described a number of challenges associated with working in a medium-secure forensic setting. Perhaps unique to a forensic environment, many of these challenges might be better conceptualised as difficulties in maintaining safety and security. Participants in this study referred to issues with physical and psychological safety at an individual and team level alongside relational security. As a concept developed for secure-hospital settings, relational security is described as staff having a knowledge and understanding of their patients and being able to translate that information into appropriate care approaches. Breaches of this might include a lack of personal or team boundaries, being unaware of your own feelings and behaviours towards patients, hopelessness regarding treatment, and failing to model positive relationships (Royal College of Psychiatrists, 2015).

Whilst it has been suggested that modern forensic psychiatric nursing is disproportionately geared towards safety approaches (Slemon et al., 2017), perhaps leading to greater perceived threats of violence in forensic psychiatric nurses compared to other branches of mental health nursing (Jacob & Holmes, 2011), many participants did describe having been assaulted and many had been involved in challenging emotive interactions with a patient. Our findings suggest that a key threat to relational security in the forensic context was interpersonally challenging and abusive patient behaviour. It seemed that these relational breaches posed a threat to physical security and sometimes culminated in assaultive behaviour towards staff. Consistent with the literature, this appeared to impact on staff wellbeing leading to increased stress and staff sickness (Brown et al., 2017; Currid, 2009). Incidents of both verbal and physical abuse, along with perceived manipulation, appeared to contribute to negative perceptions of patients, impacting on the nurse-patient relationship. All of these

difficulties provide a challenge in maintaining psychological safety and positive relational security. Furthermore, at a team level, the outcomes from this study suggest that team splitting and polarised views of patients can reinforce negative staff attitudes towards patients and lead to conflict amongst colleagues. Although a common occurrence in acute mental health settings (Beryl et al., 2018), splitting appeared to be specifically associated with inconsistent care approaches within the team.

In agreement with other studies, our findings supported the notion that nurses in acute mental health settings can develop negative attitudes towards particular patients (Linden & Kavangh, 2012; Markham, 2003), and that they can feel hopeless regarding treatment and prognosis (Ross & Goldner, 2009). Since respect and hope are deemed to be core facets of a positive therapeutic relationship in forensic settings (Niebieszczanski, Dent, & McGowan, 2016), these attitudes have the potential to impact upon the recovery ethos of NHS forensic settings (Simpson & Penney, 2011), thus, overall patient care and the effective management of risk (RCP, 2015).

In line with research from other settings (Kellett et al., 2014; Kerr, 1999; Thompson et al., 2008), the CAT training in this study appeared to successfully address some of the key issues pertinent to nurse-patient relationships and aspects of physical, psychological, and relational security in a forensic setting. In concordance with Carradice (2013), the CAT-concept of reciprocal roles was pivotal in nurses developing an understanding of their patients. Importantly, it seemed that participants found the understanding of patient roles, and their development in childhood, more useful than the self-defeating behavioural procedures that patients sometimes engage in. In essence, participants appeared to find challenging behaviour less important than knowing where it comes from and why it happens. This knowledge seemed to assist participants in framing challenging patient behaviours as early survival strategies as a means of meeting basic needs. This advanced understanding of a patient's roles and interpersonal realm could be clinically useful, as developing an understanding in this area has been shown to improve staff attitudes towards patients, elicit more compassion and empathy (Gerace, Oster, O'Kane, Hayman, & Muir-Cochrane, 2018), and improve relational security (Khan, Maeshwari, & Vrklevski, 2017).

Training in CAT approaches appeared to help nurses to conceptualise a patient's verbal attacks as less personal, thus, evoke more empathy and compassion towards their patients. An interesting finding was that participants described generating a level of understanding regarding the motivation for the patient's index offence once they could make sense of how a patient related to other individuals. This finding appeared to emphasise the potential benefits role of CAT in a forensic context, since research suggests that forensic patients can elicit negative perceptions from nursing staff due to the nature of their offending (Harris et al., 2015; Sandhu et al., 2012). The understanding of patient behaviours through CAT-informed approaches could be useful, since forensic inpatients believe that being understood and treated with respect are key to fostering a positive therapeutic relationship with nursing staff (MacInnes et al., 2014).

Some participants reported the transference of CAT knowledge into adaptations to clinical practice, with suggestions that this had helped them to feel more confident in doing their job. Though research has suggested that forensic mental health nurses are more likely to take a stereotyped punitive approach based on patient aggression (Berring, Pedersen, & Buus, 2015), our findings appeared to support the idea that CAT training could help nurses and staff teams to better understand the implications of punitive approaches through better understanding of a patient's history and their limited repertoire of reciprocal roles. Participants described how CAT-informed approaches led to reflections about the function of behaviour and resulted in adaptations to seclusion procedures with specific patients. Though the use of coercive tools, such as seclusion, have been described as a specific challenge for promoting recovery in a forensic setting (Simpson & Penney, 2011), our findings support the notion that CAT-informed approaches can potentially contribute to balancing security and safety whilst maintaining recovery values.

Formulations are a core component of CAT and have been shown to help develop a shared-language, thus, alleviate blame through framing problematic behaviours as early survival strategies (Pickvance, Parry, & Howe, 2005; Ryle & Kerr, 2002). Since forensic patients value being understood by those caring for them (MacInnes et al., 2014), a promising outcome was that nurses described implementing simple visual and verbal formulations with patients to good effect. A related development in clinical

practice was the use of formulations within the wider nursing team, appearing to promote more consistent approaches. Such consistency within a clinical team can help reduce team splitting (Caruso et al., 2013; Kellett et al., 2014) which is deemed to be a key threat to both relational security (RCP, 2015) and the development of a positive therapeutic relationship (Dziopa & Ahern, 2009).

A key feature of the CAT-approach is the consideration of one's own role when engaging in a relational dynamic with a patient (Ryle & Kerr, 2002). Nurses described how a consideration of their own role in the dynamic allowed them, and their wider team, to make proactive changes in the way they related to the patient, even without the patient's active engagement. This feature of CAT appears to be particularly important when attempting to adopt a recovery focus with forensic patients who often lack motivation to engage in their treatment (Ferrito & Moore, 2017). Consideration of their own role appeared to facilitate greater self-reflections amongst participants, seemingly instilling hope that they could work with a patient and make a difference. This is something that has been shown to contribute to more positive nurse-patient relationships (Dziopa & Ahern, 2009; Niebieszczanski et al., 2016) and could contribute to positive relational security as participants were more able and willing to model positive relationships with their patients (RCP, 2015).

Educating other staff in CAT-informed approaches also appeared to be an important outcome from CAT training. Research suggests that education from nurses can help their colleagues develop a better understanding of complex patients and how to relate to them (Jones & Wright, 2017). This practice also feeds into the wider CAT ethos in the clinic where staff can attend 'CAT chats' for difficult patient presentations. The 'map and talk' CAT approach has demonstrated reflective benefits for staff, whereby the focus is on how staff and patient feel, rather than a task focus (Kemp et al., 2017). It is purported that psychological education, and having a platform to express feelings openly, can bring teams together to help reduce staff burnout and exhaustion in forensic mental health settings (Dickinson & Wright, 2008).

Regarding the training programme itself, contrary to the findings of McCann and Bowers (2005), we found that nurses benefitted from a high degree of managerial support to attend CAT training. This could be an important influence for other

programmes and, perhaps, in our study, this was encouraged due to the wider CAT ethos in the clinic. Moreover, though participants found theoretical facets of training difficult, role plays, case videos, and applying CAT concepts to genuine complex patients, were all described as conducive to learning. These findings support those of Wilkinson et al. (2017), who suggested that more successful implementations of psychological training for mental health nurses utilised interactive teaching methods and applied learning to real cases. This could be an important consideration when tailoring existing training programmes or implementing organisational training in future.

Clinical implications

The findings from this study offer preliminary support to the potential contextual and safety benefits of using a CAT model in forensic settings, however, further quantitative and qualitative research in this area would be warranted in order to draw more firm conclusions. In considering the utility of a CAT model, firstly, given the complex patient presentations in forensic settings, it is important to note that CAT is an intervention specifically developed and tailored for more complex patient problems. The literature suggests that it has been most widely applied to personality disorders and psychosis (Calvert & Kellett, 2014). Secondly, the CAT framework offers some useful applications in the context of nurse-patient relationships and managing challenging behaviour. It emphasises a nurse's own role in a dynamic with a patient, operating on the premise that modelling healthy relational patterns can elicit change (Ryle & Kerr, 2002) and improve relational safety (RCP, 2015). In light of this, it does not require active patient engagement to evoke relational change, which can be particularly useful for a team in a setting where patients are likely to exhibit low motivation for change (Simpson & Penney, 2011). Finally, CAT aims to make clear associations between individual's early history of relationships, and their current interpersonal functioning. CAT formulation is dedicated to conceptualising patient difficulties as early survival strategies to help them cope with childhood trauma (Ryle & Kerr, 2002). This approach can be particularly useful in an environment where it is difficult to maintain empathy, and for developing more consistent team approaches.

Participants described the simplicity of reciprocal roles in making sense of challenging patient behaviours. Though it was expected that participants would find practical means of managing difficult behaviours most helpful, we found that understanding the origins of the behaviour was a more salient aspect of CAT training for most participants. This finding could inform future training developments and guide supervision by emphasising patient history and the development of reciprocal roles. In addressing some of the issues reported in the literature (McCann & Bowers, 2005; Wilkinson et al., 2017), this particular approach demonstrated strong support for nurses to attend from management and the method of training delivery was based on interactive learning, skills-based practice, and the model was applied to genuine case studies. It would seem that the support of service managers to attend training, and the 'theory, real case examples, skills practice' elements of training, are important areas to consider when thinking about implementing a large-scale, organisational-level training.

Strengths and limitations

This training programme was designed for mental health professionals working in a forensic medium-secure setting. A strength of this study was the qualitative approach in obtaining rich information from a group this training was designed for. This allows the training programme to be tailored to fit with participant needs and the aspects of training they valued.

This study utilised a small convenience sample based on which nursing staff had completed the clinic's CAT training and was reliant on self-report data rather than objective evidence of the consideration or implementation of CAT approaches. Those who attended the training likely expressed a desire to attend and are therefore more likely to experience such training as beneficial. Moreover, service-user views, whilst out-with the scope of this study, are a potentially important source of data that were not obtained. Whilst numerous professions, including forensic psychiatrists, occupational therapists, social workers, and nursing assistants, completed the CAT training, this study only focussed on qualified mental health nurses. Nurses spend the majority of their working day conducting direct work with patients and were therefore

selected to be the focus of this study. Furthermore, the mixing of professions in a qualitative article could prove problematic in terms of interpreting the results.

Since CAT training is the predominant model in the chosen clinic, and this study was a qualitative piece comprised of a convenience sample, we did not seek to compare CAT training to other types of therapeutic training, thus, only tentative conclusions should be drawn at this stage regarding the important therapeutic ingredients and their specificity to the CAT approach. Finally, some members of the research team were employed in the clinic and helped to develop and deliver the CAT training. This represents a potential source of bias, it would therefore be prudent to declare this.

Recommendations

Most of the literature focuses on nursing perceptions in acute settings, future research might look to explore how CAT training impacts on other professions, since the training in the clinic is also delivered to psychiatrists, occupational therapists, nursing assistants, and other disciplines. Associated with this, it is clear that this training programme occurred in an environment influenced by an existing CAT ethos. Further exploration of implementing CAT training in other forensic environments could be useful. Specifically, comparisons with other therapeutic models and service-user views would allow us to draw more firm conclusions.

Our findings suggest numerous benefits of CAT approaches pertaining to the maintenance of positive relational security in a safety-orientated environment. However, the literature relating to this is sparse. Further qualitative and quantitative analysis of the benefits of CAT approaches in maintaining positive relational security in forensic settings could be a rich avenue of future research.

References

Berring, L. L., Pedersen, L., & Buus, N. (2015). Discourses of aggression in forensic mental health: A critical discourse analysis of mental health nursing staff records. *Nursing inquiry*, *22*(4), 296-305. https://doi.org/10.1111/nin.12113

Beryl, R., Davies, J., & Völlm, B. (2018). Lived experience of working with female patients in a high-secure mental health setting. *International journal of mental health nursing*, *27*(1), 82-91. https://doi.org/10.1111/inm.12297

Beryl, R., & Völlm, B. (2018). Attitudes to personality disorder of staff working in high-security and medium-security hospitals. *Personality and mental health*, *12*(1), 25-37. https://doi.org/10.1002/pmh.1396

Bodner, E., Cohen-Fridel, S., Mashiah, M., Segal, M., Grinshpoon, A., Fischel, T., & Iancu, I. (2015). The attitudes of psychiatric hospital staff toward hospitalization and treatment of patients with borderline personality disorder. *BMC psychiatry*, *15*(1), 2. https://doi.org/10.1186/s12888-014-0380-y

Brown, D., Igoumenou, A., Mortlock, A. M., Gupta, N., & Das, M. (2017). Work-related stress in forensic mental health professionals: a systematic review. *Journal of Forensic Practice*, *19*(3), 227-238. https://doi.org/10.1108/JFP-05-2016-0024

Bruce, M., Horgan, H., Kerr, R., Cullen, A., & Russell, S. (2017). Psychologically informed practice (PIP) for staff working with offenders with personality disorder: A pragmatic exploratory trial in approved premises. *Criminal Behaviour and Mental Health*, *27*(4), 290-302. https://doi.org/10.1002/cbm.1994

Calvert, R., & Kellett, S. (2014). Cognitive analytic therapy: A review of the outcome evidence base for treatment. *Psychology and Psychotherapy: Theory, Research and Practice*, *87*(3), 253-277. https://doi.org/10.1111/papt.12020

Carradice, A. (2013). 'Five-Session CAT'Consultancy: Using CAT to Guide Care Planning with People Diagnosed with Personality Disorder within Community Mental Health Teams. *Clinical psychology & psychotherapy*, *20*(4), 359-367. https://doi.org/10.1111/j.1447-0349.2008.00521.x

Caruso, R., Biancosino, B., Borghi, C., Marmai, L., Kerr, I. B., & Grassi, L. (2013). Working with the 'difficult'patient: The use of a contextual cognitive-analytic therapy based training in improving team function in a routine psychiatry service setting. *Community mental health journal*, *49*(6), 722-727. https://doi.org/10.1007/s10597-012-9579-x

Chadwick, P., Williams, C., & Mackenzie, J. (2003). Impact of case formulation in cognitive behaviour therapy for psychosis. *Behaviour research and therapy*, *41*(6), 671-680. https://doi.org/10.1016/S0005-7967(02)00033-5

Coid, J., Kahtan, N., Cook, A., Gault, S., & Jarman, B. (2001). Predicting admission rates to secure forensic psychiatry services. *Psychological Medicine*, *31*(3), 531-539. https://doi.org/10.1017/S003329170100366X

Coid, J., Kahtan, N., Gault, S., Cook, A., & Jarman, B. (2001). Medium secure forensic psychiatry services: comparison of seven English health regions. *The British Journal of Psychiatry*, *178*(1), 55-61. https://doi.org/10.1192/bjp.178.1.55

Currid, T. (2009). Experiences of stress among nurses in acute mental health settings. *Nursing Standard (through 2013)*, *23*(44), 40. https://doi.org/10.7748/ns.23.44.40.s51

Davis, A. H., Savicki, V., Cooley, E. J., & Firth, J. L. (1989). Burnout and counselor practitioner expectations of supervision. *Counselor Education and Supervision*, *28*(3), 234-241. https://doi.org/10.1002/j.1556-6978.1989.tb01112.

Dickinson, T., & Wright, K. M. (2008). Stress and burnout in forensic mental health nursing: a literature review. *British Journal of Nursing*, *17*(2), 82-87. https://doi.org/10.12968/bjon.2008.17.2.28133

Dunn, M., & Parry, G. (1997). A formulated care plan approach to caring for people with borderline personality disorder in a community mental health service setting. In *Clinical Psychology Forum. 104*,19-22.

Dziopa, F., & Ahern, K. J. (2009). What makes a quality therapeutic relationship in psychiatric/mental health nursing: A review of the research literature. *Internet Journal of Advanced Nursing Practice*, *10*(1), 7-7.

Edwards, D., & Burnard, P. (2003). A systematic review of stress and stress management interventions for mental health nurses. *Journal of advanced nursing*, *42*(2), 169-200. https://doi.org/10.1046/j.1365-2648.2003.02600.x

Edward, K. L., Hercelinskyj, G., & Giandinoto, J. A. (2017). Emotional labour in mental health nursing: an integrative systematic review. *International journal of mental health nursing*. 26(3), 215-225. https://doi.org/10.1111/inm.12330

Ewers, P., Bradshaw, T., McGovern, J., & Ewers, B. (2002). Does training in psychosocial interventions reduce burnout rates in forensic nurses?. *Journal of Advanced Nursing*, *37*(5), 470-476. https://doi.org/10.1046/j.1365-2648.2002.02115.x

Ferrito, M., & Moore, E. (2017). An exploratory study on the issues and challenges clinicians encounter in the application of cognitive behavioural therapy with mentally disordered offender patients. *The Cognitive Behaviour Therapist*, *10*. https://doi.org/10.1017/S1754470X17000150

Freshwater, K., & Kerr, I. (2006). CAT skills training in mental health settings. *Reformulation,* Summer, 17-18.

Gerace, A., Oster, C., O'kane, D., Hayman, C. L., & Muir-Cochrane, E. (2018). Empathic processes during nurse–consumer conflict situations in psychiatric inpatient units: A qualitative study. *International journal of mental health nursing*, *27*(1), 92-105. https://doi.org/10.1111/inm.12298

Harris, D. M., Happell, B., & Manias, E. (2015). Working with people who have killed: The experience and attitudes of forensic mental health clinicians working with forensic patients. *International journal of mental health nursing*, *24*(2), 130-138. https://doi.org/10.1111/inm.12113

Jacob, J. D., & Holmes, D. (2011). Working under threat: Fear and nurse–patient interactions in a forensic psychiatric setting. *Journal of forensic nursing*, *7*(2), 68-77. https://doi.org/10.1111/j.1939-3938.2011.01101.x

Johnson, S., Wood, S., Paul, M., Osborn, D. P., Wearn, E., Lloyd-Evans, B., ... & Hundt, G. (2011). Inpatient mental health staff morale: a national investigation. *Final report*.

Jones, E. S., & Wright, K. M. (2017). "They're Really PD Today" An Exploration of Mental Health Nursing Students' Perceptions of Developing a Therapeutic Relationship with Patients with a Diagnosis of Antisocial Personality Disorder. *International journal of offender therapy and comparative criminology*, *61*(5), 526-543. https://doi.org/10.1177/0306624X15594838

Kasmi, Y. (2010). Profiling medium secure psychiatric intensive care unit patients. *Journal of Psychiatric Intensive Care*, *6*(2), 65-71. https://doi.org/10.1017/S1742646409990185

Kellett, S., Wilbram, M., Davis, C., & Hardy, G. (2014). Team consultancy using cognitive analytic therapy: A controlled study in assertive outreach. *Journal of psychiatric and mental health nursing*, *21*(8), 687-697. https://doi.org/10.1111/jpm.12123

Kemp, N., Bickerdike, A., & Bingham, C. (2017). 'Map and Talk': A CAT approach in a Forensic Setting. *International Journal of Cognitive Analytic Therapy and Relational Mental Health, 1*(1), 147-162.

Kerr, I. B. (1999). Cognitive-analytic therapy for borderline personality disorder in the context of a community mental health team: Individual and organizational psychodynamic implications. *British Journal of Psychotherapy*, *15*(4), 425-438. https://doi.org/10.1111/j.1752-0118.1999.tb00473.x

Kerr, I. B., Dent-Brown, K., & Parry, G. D. (2007). Psychotherapy and mental health teams. *International Review of Psychiatry*, *19*(1), 63-80. https://doi.org/10.1080/09540260601109380

Khan, A., Maheshwari, R., & Vrklevski, L. (2017). Clinician Perspectives of Inpatient Forensic Psychiatric Rehabilitation in a Low Secure Setting: A Qualitative Study. *Psychiatry, Psychology and Law*, 1-12. https://doi.org/10.1080/13218719.2017.1396863

Kirkland, J., & Baron, E. (2015). Using a cognitive analytic approach to formulate a complex sexual and violent offender to inform multi-agency working: developing a shared understanding. *Journal of Sexual Aggression*, *21*(3), 394-405. https://doi.org/10.1080/13552600.2014.939596

Lamb, N., Sibbald, S., & Stirzaker, A. (2018). Shining lights in dark corners of people's lives: Reaching consensus for people with complex mental health difficulties who are given a diagnosis of personality disorder. *Criminal Behaviour and Mental Health*, *28*(1), 1-4. https://doi.org/10.1002/cbm.2068

Linden, M., & Kavanagh, R. (2012). Attitudes of qualified vs. student mental health nurses towards an individual diagnosed with schizophrenia. *Journal of Advanced Nursing*, *68*(6), 1359-1368. https://doi.org/10.1111/j.1365-2648.2011.05848.x

MacInnes, D., Courtney, H., Flanagan, T., Bressington, D., & Beer, D. (2014). A cross sectional survey examining the association between therapeutic relationships and service user satisfaction in forensic mental health settings. *BMC research notes*, *7*(1), 657. https://doi.org/10.1186/1756-0500-7-657

Markham, D. (2003). Attitudes towards patients with a diagnosis of 'borderline personality disorder': Social rejection and dangerousness. *Journal of mental health*, *12*(6), 595-612. https://doi.org/10.1080/09638230310001627955

Marshall, J., Freshwater, K., & Potter, S. (2014). Using Cognitive Analytic Therapy within a forensic setting: An overarching relational model. *Forensic Update 2014 Annual Compendium,* 132-137.

Mason, T., Coyle, D., & Lovell, A. (2008). Forensic psychiatric nursing: skills and competencies: II clinical aspects. *Journal of Psychiatric and Mental Health Nursing*, *15*(2), 131-139. https://doi.org/10.1111/j.1365-2850.2007.01192.x

Mason, T., Hall, R., Caulfied, M., & Melling, K. (2010). Forensic nurses' perceptions of labels of mental illness and personality disorder: clinical versus management issues. *Journal of psychiatric and mental health nursing*, *17*(2), 131-140. https://doi.org/10.1111/j.1365-2850.2009.01483.x

McCann, E., & Bowers, L. (2005). Training in cognitive behavioural interventions on acute psychiatric inpatient wards. *Journal of Psychiatric and Mental Health Nursing*, *12*(2), 215-222. https://doi.org/10.1111/j.1365-2850.2004.00822.x

McLeod, H. J., Deane, F. P., & Hogbin, B. (2002). Changing staff attitudes and empathy for working with people with psychosis. *Behavioural and Cognitive Psychotherapy*, *30*(4), 459-470. https://doi.org/10.1017/S1352465802004071

Melzer, D., Tom, B. D., Brugha, T., Fryers, T., Gatward, R., Grounds, A., ... & Meltzer, H. (2004). Access to medium secure psychiatric care in England and Wales. 3: The clinical needs of assessed patients. *Journal of Forensic Psychiatry & Psychology*, *15*(1), 50-65. https://doi.org/10.1080/14789940410001661856

National Offender Management Service (2015). The offender personality disorder pathway strategy 2015. Accessed May 2018 from: https://www.england.nhs.uk/commissioning/wp-content/uploads/sites/12/2016/02/opd-strategy-nov-15.pdf

Newman, C., Patterson, K., Eason, M., & Short, B. (2016). Defining the role of a forensic hospital registered nurse using the Delphi method. *Journal of nursing management*, *24*(8), 1130-1136. https://doi.org/10.1111/jonm.12422

Niebieszczanski, R. J., Dent, H., & McGowan, A. (2016). 'Your personality is the intervention': a grounded theory of mental health nurses' beliefs about hope and experiences of fostering hope within a secure setting. *The Journal of Forensic Psychiatry & Psychology*, *27*(3), 419-442. https://doi.org/10.1080/14789949.2015.1134626

Parkinson, S., Eatough, V., Holmes, J., Stapley, E., & Midgley, N. (2016). Framework analysis: A worked example of a study exploring young people's experiences of depression. *Qualitative research in psychology*, *13*(2), 109-129. https://doi.org/10.1080/14780887.2015.1119228

Pickvance, D., Parry, G., & Howe, A. (2004). A cognitive analytic framework for understanding and managing problematic frequent attendance in primary care. *Primary Care Mental Health*, *2*(3), 165-174.

Ritchie, J., Lewis, J., Nicholls, C. M., & Ormston, R. (Eds.). (2013). *Qualitative research practice: A guide for social science students and researchers*. Sage.

Ross, C. A., & Goldner, E. M. (2009). Stigma, negative attitudes and discrimination towards mental illness within the nursing profession: a review of the literature. *Journal of psychiatric and mental health nursing*, *16*(6), 558-567. https://doi.org/10.1111/j.1365-2850.2009.01399.x

Royal College of Psychiatrists (2015). See, think, act: your guide to relational security. Accessed May 2018 from: https://www.rcpsych.ac.uk/pdf/STA_hndbk_2ndEd_Web_2.pdf

Royal College of Psychiatrists (2016). Standards for forensic mental health services: Low and medium secure care. Accessed May 2018 from: https://www.rcpsych.ac.uk/pdf/QNFMHS_Standards_2016%20(002).pdf

Ryle, A., & Kerr, I. B. (2003). *Introducing cognitive analytic therapy: Principles and practice*. John Wiley & Sons.

Sandhu, D. K., Rose, J., Rostill-Brookes, H. J., & Thrift, S. (2012). 'It's Intense, to an Extent': a qualitative study of the emotional challenges faced by staff working on a treatment programme for intellectually disabled sex offenders. *Journal of Applied Research in Intellectual Disabilities*, *25*(4), 308-318. https://doi.org/10.1111/j.1468-3148.2011.00667.x

Serran, G., & Marshall, W. (2010). Therapeutic process in the treatment of sexual offenders: A review article. *The British Journal of Forensic Practice*, *12*(3), 4-16. https://doi.org/10.5042/bjfp.2010.0421

Sherring, S., & Knight, D. (2009). An exploration of burnout among city mental health nurses. *British Journal of Nursing*, *18*(20), 1234-1240. https://doi.org/10.12968/bjon.2009.18.20.45114

Simpson, A. I., & Penney, S. R. (2011). The recovery paradigm in forensic mental health services. *Criminal Behaviour and Mental Health*, *21*(5), 299-306. https://doi.org/10.1002/cbm.823

Slemon, A., Jenkins, E., & Bungay, V. (2017). Safety in psychiatric inpatient care: The impact of risk management culture on mental health nursing practice. *Nursing inquiry*, *24*(4). https://doi.org/10.1111/nin.12199

Srivastava, A., & Thomson, S. B. (2009). Framework analysis: a qualitative methodology for applied policy research. *Journal of Administration and Governance 72*. Accessed May 2018 from: https://ssrn.com/abstract=2760705

Summers, A. (2006). Psychological formulations in psychiatric care: staff views on their impact. *The Psychiatrist*, *30*(9), 341-343. https://doi.org/10.1192/pb.30.9.341

The Association for Cognitive Analytic Therapy (ACAT; 2018). What is Cognitive Analytic Therapy? Accessed May 2018 from: https://www.acat.me.uk/factsheets/What-is-CAT-brief-guide.pdf

The Forensic Matrix (2011). The Forensic Network, NHS Scotland. Accessed May 2018 from: http://www.forensicnetwork.scot.nhs.uk/

Thompson, A. R., Donnison, J., Warnock-Parkes, E., Turpin, G., Turner, J., & Kerr, I. B. (2008). Multidisciplinary community mental health team staff's experience of a 'skills level' training course in cognitive analytic therapy. *International Journal of Mental Health Nursing*, *17*(2), 131-137. https://doi.org/10.1111/j.1447-0349.2008.00521.x

Totman, J., Hundt, G. L., Wearn, E., Paul, M., & Johnson, S. (2011). Factors affecting staff morale on inpatient mental health wards in England: a qualitative investigation. *BMC psychiatry*, *11*(1), 68. https://doi.org/10.1186/1471-244X-11-68

Walsh, S. (1996). Adapting cognitive analytic therapy to make sense of psychologically harmful work environments. *Psychology and Psychotherapy: Theory, Research and Practice*, *69*(1), 3-20. https://doi.org/10.1111/j.2044-8341.1996.tb01846.x

Wilkinson, H., Whittington, R., Perry, L., & Eames, C. (2017). Does Formulation of Service Users' Difficulties Improve Empathy in Forensic Mental Health Services?. *Journal of Forensic Psychology Research and Practice*, *17*(3), 157-178. https://doi.org/10.1080/24732850.2017.1297758

Yanchus, N. J., Periard, D., & Osatuke, K. (2017). Further examination of predictors of turnover intention among mental health professionals. *Journal of psychiatric and mental health nursing*, *24*(1), 41-56. https://doi.org/10.1111/jpm.12354

Supplementary appendix contents

A. University of Edinburgh Ethical approval
B. Quality Improvement Team approval
C. Participant information sheet and consent form
D. Interview schedule
E. *Qualitative Health Research* author guidelines

A. University of Edinburgh Ethical Approval

SCHOOL of HEALTH IN SOCIAL SCIENCE
CLINICAL AND HEALTH PSYCHOLOGY

The University of Edinburgh
Medical School
Doorway 6, Teviot Place
Edinburgh EH8 9AG

Telephone 0131 651 3969
Fax 0131 650 3891
Email submitting.ethics@ed.ac.uk

David Barker
Trainee Clinical Psychologist
School of Health in Social Science
University of Edinburgh

12 October 2017

Dear David,

Application for Level 1 Ethical Approval

Reference: CLIN411
Project Title: Training Forensic Mental Health Nurses in Brief Cognitive Analytic Therapy (CAT): The Impact on Complex Case Conceptualisation and Implications for Practice
Academic Supervisor: Emily Newman / Ethel Quayle

Thank you for submitting the above research project for review by the Department of Clinical and Health Psychology Ethics Research Panel. I can confirm that the submission has been independently reviewed and was approved on the 27th September 2017.

Should there be any change to the research protocol it is important that you alert us to this as this may necessitate further review.

Yours sincerely,

Kirsty Gardner
Administrative Secretary, Clinical Psychology

B. NHS Lothian Quality Improvement Team approval

Reply all |

Delete

Junk |

RE: Research and QI Project

BDBarker, David <David.Barker@nhslothian.scot.nhs.uk>

From: Brown, Jo
Sent: 19 September 2017 14:23
To: Barker, David
Subject: Research and QI Project

Dear David,

On behalf of the QI Team here at the Orchard Clinic, I am writing to you to confirm that your proposed project was discussed at our meeting on the 11th September 2017. Present at the meeting were John McLachlan, Chair of the QI Team and Charge Nurse, Katharine Russell, Consultant Forensic Clinical Psychologist and Professional Lead for Forensic Clinical Psychology and myself, Consultant Forensic Psychiatrist.

Thank you for providing us with the details of your project in advance of the meeting. I am happy to confirm that the QI Team at the Orchard Clinic are supportive of the project and have approved it.

Please let me know if you require further confirmation of this decision in letter format.

Thanks,

Dr Jo Brown

Jo Brown
Consultant Forensic Psychiatrist
Orchard Clinic
Royal Edinburgh Hospital

C. Participant information sheet and consent form

Participant Information Sheet and Consent Form

You are being invited to take part in a research project. Before you decide whether or not to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Contact me if there is anything that is not clear or if you would like more information.

What is the purpose of the study?

The aim of this study is to explore the impact of Cognitive Analytic Therapy (CAT) training on your way of thinking and working with patients within the Orchard Clinic.

Why have I been asked to take part?

You have been asked to take part because you currently work in the Orchard Clinic and have completed the CAT training in the past 5 years.

Do I have to take part?

No - it is up to you to decide whether or not to take part. If you do decide to take part, I will ask that you put your initials in the section at the end that asks if you would like to participate. You are free to withdraw from the study at any time and without giving a reason.

To withdraw from the study, simply contact the researcher and provide your unique ID number located at the top of the consent form and your data will be removed from the study.

What will happen if I take part?

If you agree to take part, I will ask you to complete an interview with the lead researcher during which you will be asked about CAT training and your work in the clinic. This interview will consist of semi-structured questions and you may be asked follow-up questions to your original answer. All interviews will be audio recorded so they can later be transcribed. Any patient or participant-identifiable information (i.e. names) will be omitted from the data during transcription.

What are the possible benefits of taking part?

There are no direct benefits of taking part in this study, but the results from this study might inform future training for staff and the development of services and/or be used to support staff wellbeing. Your participation would be hugely appreciated.

What are the possible disadvantages and risks of taking part?

There are no obvious risks or disadvantages to taking part. Recalling information about working with complex clients could potentially lead to distress. All participants will have an opportunity to discuss this following interview and will be advised to utilise professional support available if necessary. All data with be anonymous and stored confidentially in accordance with ethical guidelines and NHS/University of Edinburgh policy. No identifiable information will be collected from participants.

What if there is a problem?

If you believe you have been harmed in any way by taking part in this study, you have the right to pursue a complaint. You can complain to the University of Edinburgh, who are acting as a research sponsor. Details about this process are available from the research team. For more information or any other

concerns/questions, please contact: David Barker, Trainee Clinical Psychologist at david.barker10@nhs.net or s1475202@sms.ed.ac.uk who will do his best to answer your questions.

Will my taking part in the study be kept confidential?

Yes. No personal or identifiable information, such as your name or date of birth, will be recorded in the study. All data is stored securely on a password protected computer in accordance with NHS/University of Edinburgh policy. No individual, other than the researcher, will have access to this data.

What will happen to the results of the study?

The study will be written up and submitted as a piece of work for the Doctorate in Clinical Psychology programme at the University of Edinburgh. Again, the results will not include any identifiable information. The findings may also be discussed within the clinic. Findings may also be disseminated in other written or visual formats (e.g. journal article or poster presentation).

Who is organising the research and why?

The research is being organised by the University of Edinburgh with the support of NHS Lothian.

Who has reviewed the study?

The study proposal has been reviewed by the University of Edinburgh's ethical approval team and the Quality Improvement Team of NHS Lothian.

If you have any further questions about the study, please contact David Barker by email: david.barker10@nhs.net or s1475202@sms.ed.ac.uk

Thank you for taking the time to read this information sheet.

CONSENT FORM

CAT training in the Orchard Clinic

Participant ID:

Age: **Years experience:** **Year attended CAT training:**

Lead researcher contact details:
David Barker
Email: david.barker10@nhs.net; s1475202@sms.ed.ac.uk

Please initial box

1. I confirm that I have read and understand the information sheet (as specified in this document header) for the above study and have had the opportunity to consider the information and ask questions. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. ☐

3. I understand that data collected during the study may be looked at by individuals from the Sponsor (University of Edinburgh) or other authorities, where it is relevant to my taking part in this research. I give permission for these individuals to have access to this data. ☐

4. I agree to take part in the above study ☐

_____	_____	_____
Name of Participant	Date	Signature

_____	_____	_____
Name of Person taking consent	Date	Signature

D. Interview schedule

INTERVIEW SCHEDULE

Tell me how you came to do the OC CAT training?

- What did you expect to get out of it?
- What did you get out of completing the training?

Tell me about things that stood out for you from the training?

Tell me about some of the challenges of working with your patients?

Thinking of a complex patient you have worked with, what made them difficult?

- What impact did that have on you?
- Did working with them raise any issues for you?
- How did you feel about the relationship over the time you worked with them?

What impact did they have on the whole team?

Did anyone disagree with you about the patient?

- If yes, how did that feel?

What does it feel like to work on a ward where a patient favours particular members of staff and seems to dislike others? What helps/doesn't help with this?

- What influence, if any, did the CAT training have on how you made sense of working with this patient?

Difficult patients can often bring out strong emotional reactions in people working closely with them.

- How do you and members of staff react to difficult patients?
- What helps you to deal with the difficult emotions patients bring up for you?

Consider a patient who has 'pushed buttons'. In those moments, how difficult has it been to try and understand?

- How has CAT training helped with this?

Tell me what impact, if any, CAT training has had on how you think about this patient and your relationship with them?

Difficult patients often behave in challenging ways in an attempt to meet a need for them. How, if at all, has CAT training helped you make sense of this?

If you have developed any new ways of working, what are they?

- Tell me about the ways, if any, in which the CAT training impacted on the way you work as a team?

E. *Qualitative Health Research* author guidelines

Preparing your manuscript

Article Format (*see previously published articles in QHR for style*):

Title page: Title should be succinct; list all authors and their affiliation; keywords. Please upload the title page separately from the main document.

Blinding: Do not include any author identifying information in your manuscript, including author's own citations. Do not include acknowledgements until your article is accepted and unblinded.

Abstract: Unstructured, 150 words. This should be the first page of the main manuscript, and it should be on its own page.

Length: QHR does not have a word or page count limit. Manuscripts should be as tight as possible, preferably less than 30 pages including references. Longer manuscripts, if exceptional, will be considered.

Methods: QHR readership is sophisticated; excessive details not required.

Ethics: Include a statement of IRB approval and participant consent. Present demographics as a group, not listed as individuals. Do not link quotations to particular individuals unless essential (as in case studies) as this threatens anonymity.

Results: Rich and descriptive; theoretical; linked to practice if possible.

Discussion: Link your findings with research and theory in literature, including other geographical areas and quantitative research.

References: APA format. Use pertinent references only. References should be on a separate page.

Additional Editor's Preferences:

Please do not refer to your manuscript as a "paper;" you are submitting an "article."

The word "data" is plural.

Word processing formats

Preferred formats for the text and tables of your manuscript are Word DOC or PDF. The text should be double-spaced throughout with standard 1 inch margins (APA formatting). Text should be standard font (i.e., Times New Roman) 12 point.

Artwork, figures and other graphics

Figures: Should clarify text.

Include figures, charts, and tables created in MS Word in the main text rather than at the end of the document.

Figures, tables, and other files created outside of Word should be submitted separately. Indicate where table should be inserted within manuscript (i.e., INSERT TABLE 1 HERE).

Photographs: Should have permission to reprint and faces should be concealed using mosaic patches – unless permission has been given by the individual to use their identity. This permission must be forwarded to QHR's Managing Editor.

- TIFF, JPED, or common picture formats accepted. The preferred format for graphs and line art is EPS.
- Resolution: Rasterized based files (i.e. with .tiff or .jpeg extension) require a resolution of at least **300 dpi** (dots per inch). Line art should be supplied with a minimum resolution of **800 dpi**.
- Dimension: Check that the artworks supplied match or exceed the dimensions of the journal. Images cannot be scaled up after origination.

 Figures supplied in color will appear in color online regardless of whether or not these illustrations are reproduced in color in the printed version. For specifically requested color reproduction in print, you will receive information regarding the costs from SAGE after receipt of your accepted article.

4Supplementary material

This journal is able to host additional materials online (e.g., datasets, podcasts, videos, images, etc.) alongside the full-text of the article. These will be subjected to peer-review alongside the article.

Supplementary files will be uploaded as supplied. They will not be checked for accuracy, copyedited, typeset or proofread. The responsibility for scientific accuracy and file functionality remains with the author(s). SAGE will only publish supplementary material subject to full copyright clearance. This means that if the content of the file is not original to the author, then the author will be responsible for clearing all permissions prior to publication. The author will be required to provide copies of permissions and details of the correct copyright acknowledgement.

Journal layout

In general, QHR adheres to the guidelines contained in the Publication Manual of the American Psychological Association ["APA"], 6th edition (ISBN 10:1-4338-0561-8, softcover; ISBN 10:1-4338-0559-6, hardcover; 10:1-4338-0562, spiral bound), with regard to manuscript preparation and formatting. These guidelines are referred to as the APA Publication Manual, or just APA. Additional help may be found online at http://www.apa.org/, or search the Internet for "APA format."

Reference style

QHR adheres to the APA reference style. Click here to review the guidelines on APA to ensure your manuscript conforms to this reference style.

English language editing services

Articles must be professionally edited; this is the responsibility of the author. Authors seeking assistance with English language editing, translation, or figure and manuscript formatting to fit the journal's specifications should consider using SAGE's Language Services.

Thesis portfolio references

Aakre, J. M., Seghers, J. P., St-Hilaire, A., & Docherty, N. (2009). Attributional style in delusional patients: A comparison of remitted paranoid, remitted nonparanoid, and current paranoid patients with nonpsychiatric controls. *Schizophrenia Bulletin*, *35*(5), 994–1002. https://doi.org/10.1093/schbul/sbn033

Barendregt, J., & Doi, S. A. (2016). MetaXL User Guide version 5.3.

Bentall, R. P., Corcoran, R., Howard, R., Blackwood, N., & Kinderman, P. (2001). Persecutory delusions: A review and theoretical integration. *Clinical Psychology Review*. https://doi.org/10.1016/S0272-7358(01)00106-4

Bentall, R. P., Kinderman, P., & Kaney, S. (1994). The self, attributional processes and abnormal beliefs: Towards a model of persecutory delusions. *Behaviour Research and Therapy*, *32*(3), 331–341. https://doi.org/10.1016/0005-7967(94)90131-7

Berlin, J. A., & Ghersi, D. (2005). Preventing publication bias: Registries and prospective meta-analysis. *Publication bias in meta-analysis: Prevention, assessment and adjustments*, 35-48. https://doi.org/10.1002/0470870168.ch3

Berman, N. G., & Parker, R. a. (2002). Meta-analysis: neither quick nor easy. *BMC Medical Research Methodology*, *2*, 10. https://doi.org/10.1186/1471-2288-2-10

Berring, L. L., Pedersen, L., & Buus, N. (2015). Discourses of aggression in forensic mental health: A critical discourse analysis of mental health nursing staff records. *Nursing inquiry*, *22*(4), 296-305. https://doi.org/10.1111/nin.12113

Berry, K., Bucci, S., Kinderman, P., Emsley, R., & Corcoran, R. (2015). An investigation of attributional style, theory of mind and executive functioning in acute paranoia and remission. *Psychiatry Research*, *226*(1), 84–90. https://doi.org/10.1016/j.psychres.2014.12.009

Beryl, R., Davies, J., & Völlm, B. (2018). Lived experience of working with female patients in a high-secure mental health setting. *International journal of mental health nursing*, *27*(1), 82-91. https://doi.org/10.1111/inm.12297

Beryl, R., & Völlm, B. (2018). Attitudes to personality disorder of staff working in high-security and medium-security hospitals. *Personality and mental health*, *12*(1), 25-37. https://doi.org/10.1002/pmh.1396

Bodner, E., Cohen-Fridel, S., Mashiah, M., Segal, M., Grinshpoon, A., Fischel, T., & Iancu, I. (2015). The attitudes of psychiatric hospital staff toward hospitalization and treatment of patients with borderline personality disorder. *BMC psychiatry*, *15*(1), 2. https://doi.org/10.1186/s12888-014-0380-y

Borenstein, M., Hedges, L. V, Higgins, J. P. T., & Rothstein, H. R. (2009). Vote Counting – A New Name for an Old Problem. *Introduction to Meta-Analysis*, (1980), 251–255. https://doi.org/10.1002/9780470743386.ch28

Brown, D., Igoumenou, A., Mortlock, A. M., Gupta, N., & Das, M. (2017). Work-related stress in forensic mental health professionals: a systematic review. *Journal of Forensic Practice*, *19*(3), 227-238. https://doi.org/10.1108/JFP-05-2016-0024

Bruce, M., Horgan, H., Kerr, R., Cullen, A., & Russell, S. (2017). Psychologically informed practice (PIP) for staff working with offenders with personality disorder: A pragmatic exploratory trial in approved premises. *Criminal Behaviour and Mental Health*, *27*(4), 290-302. https://doi.org/10.1002/cbm.1994

Byrne, A., & MacLeod, A. K. (1997). Attributions and accessibility of explanations for future events in anxiety and depression. *British Journal of Clinical Psychology*, *36*(4), 505-520. https://doi.org/10.1111/j.2044-8260.1997.tb01257.x

Calvert, R., & Kellett, S. (2014). Cognitive analytic therapy: A review of the outcome evidence base for treatment. *Psychology and Psychotherapy: Theory, Research and Practice*, *87*(3), 253-277. https://doi.org/10.1111/papt.12020

Campbell, W. K., & Sedikides, C. (1999). Self-threat magnifies the self-serving bias: A meta-analytic integration. *Review of general Psychology*, *3*(1), 23. http://dx.doi.org/10.1037/1089-2680.3.1.23

Candido, C. L., & Romney, D. M. (1990). Attributional style in paranoid vs. depressed patients. *British Journal of Medical Psychology*, *63*(4), 355–363. https://doi.org/10.1111/j.2044-8341.1990.tb01630.x

Carradice, A. (2013). 'Five-Session CAT'Consultancy: Using CAT to Guide Care Planning with People Diagnosed with Personality Disorder within Community Mental Health Teams. *Clinical psychology & psychotherapy*, *20*(4), 359-367. https://doi.org/10.1111/j.1447-0349.2008.00521.x

Caruso, R., Biancosino, B., Borghi, C., Marmai, L., Kerr, I. B., & Grassi, L. (2013). Working with the 'difficult'patient: The use of a contextual cognitive-analytic therapy based training in improving team function in a routine psychiatry service setting. *Community mental health journal*, *49*(6), 722-727. https://doi.org/10.1007/s10597-012-9579-x

Chadwick, P., Williams, C., & Mackenzie, J. (2003). Impact of case formulation in cognitive behaviour therapy for psychosis. *Behaviour research and therapy*, *41*(6), 671-680. https://doi.org/10.1016/S0005-7967(02)00033-5

Cohen, J. (1988). Statistical power analysis for the behavioral sciences. *Statistical Power Analysis for the Behavioral Sciences*. https://doi.org/10.1234/12345678

Coid, J., Kahtan, N., Cook, A., Gault, S., & Jarman, B. (2001). Predicting admission rates to secure forensic psychiatry services. *Psychological Medicine*, *31*(3), 531-539. https://doi.org/10.1017/S003329170100366X

Coid, J., Kahtan, N., Gault, S., Cook, A., & Jarman, B. (2001). Medium secure forensic psychiatry services: comparison of seven English health regions. *The British Journal of Psychiatry*, *178*(1), 55-61. https://doi.org/10.1192/bjp.178.1.55

Coid, J. W., Ullrich, S., Kallis, C., Keers, R., Barker, D., Cowden, F., & Stamps, R. (2013). The Relationship Between Delusions and Violence: Findings From the East London First Episode Psychosis Study. *JAMA Psychiatry (Chicago, Ill.)*, *70*(5), 1–7. https://doi.org/10.1001/jamapsychiatry.2013.12

Csikszentmihalyi, M., & Larson, R. (2014). Validity and reliability of the experience-sampling method. In *Flow and the foundations of positive psychology* (pp. 35-54). Springer Netherlands.

Currid, T. (2009). Experiences of stress among nurses in acute mental health settings. *Nursing Standard (through 2013)*, *23*(44), 40. https://doi.org/10.7748/ns.23.44.40.s51

Davidson, C. A., Lesser, R., Parente, L. T., & Fiszdon, J. M. (2017). Psychometrics of social cognitive measures for psychosis treatment research. *Schizophrenia research*, *193*, 51-57. https://doi.org/10.1016/j.schres.2017.06.018

Davis, A. H., Savicki, V., Cooley, E. J., & Firth, J. L. (1989). Burnout and counselor practitioner expectations of supervision. *Counselor Education and Supervision*, *28*(3), 234-241. https://doi.org/10.1002/j.1556-6978.1989.tb01112.

DerSimonian, R., & Laird, N. (1986). Meta-analysis in clinical trials. *Controlled Clinical Trials*, *7*(3), 177–88. https://doi.org/10.1016/0197-2456(86)90046-2

Dickinson, T., & Wright, K. M. (2008). Stress and burnout in forensic mental health nursing: a literature review. *British Journal of Nursing*, *17*(2), 82-87. https://doi.org/10.12968/bjon.2008.17.2.28133

Diez-Alegría, C., Vázquez, C., Nieto-Moreno, M., Valiente, C., & Fuentenebro, F. (2006). Personalizing and externalizing biases in deluded and depressed patients: are attributional biases a stable and specific characteristic of delusions? *The British Journal of Clinical Psychology / the British Psychological Society*, *45*(Pt 4), 531–44. https://doi.org/10.1348/014466505X86681

Dunn, M., & Parry, G. (1997). A formulated care plan approach to caring for people with borderline personality disorder in a community mental health service setting. In *Clinical Psychology Forum. 104*,19-22.

Duval, S., Tweedie, R., Taylor, S., & Tweedie, R. (2000). Trim and fill: A Simple Funnel Plot Based Method of Testing and Adjusting for Publication Bias in Meta-analysis. *Biometrics*, *56*(2), 455–463. https://doi.org/10.1111/j.0006-341x.2000.00455.x

Dziopa, F., & Ahern, K. J. (2009). What makes a quality therapeutic relationship in psychiatric/mental health nursing: A review of the research literature. *Internet Journal of Advanced Nursing Practice*, *10*(1), 7-7.

Edwards, D., & Burnard, P. (2003). A systematic review of stress and stress management interventions for mental health nurses. *Journal of advanced nursing*, *42*(2), 169-200. https://doi.org/10.1046/j.1365-2648.2003.02600.x

Edward, K. L., Hercelinskyj, G., & Giandinoto, J. A. (2017). Emotional labour in mental health nursing: an integrative systematic review. *International journal of mental health nursing*. 26(3), 215-225. https://doi.org/10.1111/inm.12330

Ewers, P., Bradshaw, T., McGovern, J., & Ewers, B. (2002). Does training in psychosocial interventions reduce burnout rates in forensic nurses?. *Journal of Advanced Nursing*, *37*(5), 470-476. https://doi.org/10.1046/j.1365-2648.2002.02115.x

Fear, C., Sharp, H., & Healy, D. (1996). Cognitive processes in delusional disorders. *British Journal of Psychiatry*, *168*(JAN.), 61–67. https://doi.org/10.1192/bjp.168.1.61

Ferrito, M., & Moore, E. (2017). An exploratory study on the issues and challenges clinicians encounter in the application of cognitive behavioural therapy with mentally disordered offender patients. *the Cognitive Behaviour Therapist*, *10*. https://doi.org/10.1017/S1754470X17000150

Fornells-Ambrojo, M., & Garety, P. A. (2009). Understanding attributional biases, emotions and self-esteem in "poor me" paranoia: findings from an early psychosis sample. *The British Journal of Clinical Psychology / the British Psychological Society*, *48*(Pt 2), 141–62. https://doi.org/10.1348/014466508X377135

Freeman, D. (2016). Persecutory delusions: a cognitive perspective on understanding and treatment. *The Lancet Psychiatry*, *3*(7), 685-692. https://doi.org/10.1016/S2215-0366(16)00066-3

Freeman, D., Garety, P. A., Kuipers, E., Fowler, D., & Bebbington, P. E. (2002). A cognitive model of persecutory delusions. *British Journal of Clinical Psychology*, *41*(4), 331–347. https://doi.org/10.1348/014466502760387461

Freeman, D., Stahl, D., McManus, S., Meltzer, H., Brugha, T., Wiles, N., & Bebbington, P. (2012). Insomnia, worry, anxiety and depression as predictors of the occurrence and persistence of paranoid thinking. *Social psychiatry and psychiatric epidemiology*, *47*(8), 1195-1203. https://doi.org/10.1007/s00127-011-0433-1

Freshwater, K., & Kerr, I. (2006). CAT skills training in mental health settings. *Reformulation,* Summer, 17-18.

Furukawa, T. A., Barbui, C., Cipriani, A., Brambilla, P., & Watanabe, N. (2006). Imputing missing standard deviations in meta-analyses can provide accurate results. *Journal of Clinical Epidemiology*, *59*(1), 7–10. https://doi.org/10.1016/j.jclinepi.2005.06.006

Furuya-Kanamori, L., Barendregt, J. J., & Doi, S. A. (2018). A new improved graphical and quantitative method for detecting bias in meta-analysis. *International journal of evidence-based healthcare*. https://doi.org/10.1097/XEB.0000000000000141

Garety, P. A., & Freeman, D. (1999). Cognitive approaches to delusions: a critical review of theories and evidence. *The British Journal of Clinical Psychology / the British Psychological Society*, *38 (Pt 2)*, 113–154. https://doi.org/10.1348/014466599162700

Garety, P. A., & Freeman, D. (2013). The past and future of delusions research: From the inexplicable to the treatable. *British Journal of Psychiatry*. https://doi.org/10.1192/bjp.bp.113.126953

Gerace, A., Oster, C., O'kane, D., Hayman, C. L., & Muir-Cochrane, E. (2018). Empathic processes during nurse–consumer conflict situations in psychiatric inpatient units: A qualitative study. *International journal of mental health nursing*, *27*(1), 92-105. https://doi.org/10.1111/inm.12298

Guyatt, G. H., Oxman, A. D., Vist, G. E., Kunz, R., Falck-Ytter, Y., Alonso-Coello, P., & Schünemann, H. J. (2008). GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ (Clinical research ed.)*, *336*(7650), 924-926. https://doi.org/10.1136/bmj.39489.470347.AD

Harris, D. M., Happell, B., & Manias, E. (2015). Working with people who have killed: The experience and attitudes of forensic mental health clinicians working with forensic patients. *International journal of mental health nursing*, *24*(2), 130-138. https://doi.org/10.1111/inm.12113

Higgins, J. P. T., & Green, S. (2011). Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]. In *The Cochrane Collaboration* (p. Table 7.7.a: Formulae for combining groups).

Hopewell, S., Clarke, M., & Mallett, S. (2005). Grey literature and systematic reviews. *Publication bias in meta-analysis: Prevention, assessment and adjustments*, 48-72.

Hor, K., & Taylor, M. (2010). Suicide and schizophrenia: a systematic review of rates and risk factors. *Journal of psychopharmacology*, *24*(4_suppl), 81-90. https://doi.org/10.1177/1359786810385490

Hu, T., Zhang, D., & Yang, Z. (2015). The relationship between attributional style for negative outcomes and depression: A meta-analysis. *Journal of Social and Clinical Psychology*, *34*(4), 304-321. https://doi.org/10.1521/jscp.2015.34.4.304

Jacob, J. D., & Holmes, D. (2011). Working under threat: Fear and nurse–patient interactions in a forensic psychiatric setting. *Journal of forensic nursing*, *7*(2), 68-77. https://doi.org/10.1111/j.1939-3938.2011.01101.x

Johnson, S., Wood, S., Paul, M., Osborn, D. P., Wearn, E., Lloyd-Evans, B., ... & Hundt, G. (2011). Inpatient mental health staff morale: a national investigation. *Final report*.

Jolley, S., Garety, P., Bebbington, P., Dunn, G., Freeman, D., Kuipers, E., … Hemsley, D. (2006). Attributional style in psychosis-The role of affect and belief type. *Behaviour Research and Therapy*, *44*(11), 1597–1607. https://doi.org/10.1016/j.brat.2005.12.002

Jones, E. S., & Wright, K. M. (2017). "They're Really PD Today" An Exploration of Mental Health Nursing Students' Perceptions of Developing a Therapeutic Relationship With Patients With a Diagnosis of Antisocial Personality Disorder. *International journal of offender therapy and comparative criminology*, *61*(5), 526-543. https://doi.org/10.1177/0306624X15594838

Kaney, S., & Bentall, R. P. (1989). Persecutory delusions and attributional style. *Psychology and Psychotherapy: Theory, Research and Practice*, *62*(2), 191-198. https://doi.org/10.1111/j.2044-8341.1989.tb02826.x

Kasmi, Y. (2010). Profiling medium secure psychiatric intensive care unit patients. *Journal of Psychiatric Intensive Care*, *6*(2), 65-71. https://doi.org/10.1017/S1742646409990185

Keers, R., Ullrich, S., DeStavola, B. L., & Coid, J. W. (2014). Association of violence with emergence of persecutory delusions in untreated schizophrenia. *American Journal of Psychiatry*, *171*(3), 332-339. https://doi.org/10.1176/appi.ajp.2013.13010134

Kellett, S., Wilbram, M., Davis, C., & Hardy, G. (2014). Team consultancy using cognitive analytic therapy: A controlled study in assertive outreach. *Journal of psychiatric and mental health nursing*, *21*(8), 687-697. https://doi.org/10.1111/jpm.12123

Kemp, N., Bickerdike, A., & Bingham, C. (2017). 'Map and Talk': A CAT approach in a Forensic Setting. *International Journal of Cognitive Analytic Therapy and Relational Mental Health, 1*(1), 147-162.

Kerr, I. B. (1999). Cognitive-analytic therapy for borderline personality disorder in the context of a community mental health team: Individual and organizational psychodynamic implications. *British Journal of Psychotherapy*, *15*(4), 425-438. https://doi.org/10.1111/j.1752-0118.1999.tb00473.x

Kerr, I. B., Dent-Brown, K., & Parry, G. D. (2007). Psychotherapy and mental health teams. *International Review of Psychiatry*, *19*(1), 63-80. https://doi.org/10.1080/09540260601109380

Kesting, M. L., & Lincoln, T. M. (2013). The relevance of self-esteem and self-schemas to persecutory delusions: A systematic review. *Comprehensive Psychiatry*, *54*(7), 766–789. https://doi.org/10.1016/j.comppsych.2013.03.002

Khan, A., Maheshwari, R., & Vrklevski, L. (2017). Clinician Perspectives of Inpatient Forensic Psychiatric Rehabilitation in a Low Secure Setting: A Qualitative Study. *Psychiatry, Psychology and Law*, 1-12. https://doi.org/10.1080/13218719.2017.1396863

Kinderman, P., & Bentall, R. P. (1996). A new measure of causal locus: the internal, personal and situational attributions questionnaire. *Personality and Individual differences*, *20*(2), 261-264. https://doi.org/10.1016/0191-8869(95)00186-7

Kirkland, J., & Baron, E. (2015). Using a cognitive analytic approach to formulate a complex sexual and violent offender to inform multi-agency working: developing a shared understanding. *Journal of Sexual Aggression*, *21*(3), 394-405. https://doi.org/10.1080/13552600.2014.939596

Lamb, N., Sibbald, S., & Stirzaker, A. (2018). Shining lights in dark corners of people's lives: Reaching consensus for people with complex mental health difficulties who are given a diagnosis of personality disorder. *Criminal Behaviour and Mental Health*, *28*(1), 1-4. https://doi.org/10.1002/cbm.2068

Lee, D. a, Randall, F., Beattie, G., & Bentall, R. P. (2004). Delusional discourse: an investigation comparing the spontaneous causal attributions of paranoid and non-paranoid individuals. *Psychology and Psychotherapy*, *77*(Pt 4), 525–540. https://doi.org/10.1348/1476083042555361

Lincoln, T. M., Mehl, S., Exner, C., Lindenmeyer, J., & Rief, W. (2010). Attributional style and persecutory delusions. Evidence for an event independent and state specific external-personal attribution bias for social situations. *Cognitive Therapy and Research*, *34*(3), 297–302. https://doi.org/10.1007/s10608-009-9284-4

Linden, M., & Kavanagh, R. (2012). Attitudes of qualified vs. student mental health nurses towards an individual diagnosed with schizophrenia. *Journal of Advanced Nursing*, *68*(6), 1359-1368. https://doi.org/10.1111/j.1365-2648.2011.05848.x

Lyon, H. M., Kaney, S., & Bentall, R. P. (1994). The defensive function of persecutory delusions. Evidence from attribution tasks. *British Journal of Psychiatry*, *164*(MAY), 637–646. https://doi.org/10.1192/bjp.164.5.637

MacInnes, D., Courtney, H., Flanagan, T., Bressington, D., & Beer, D. (2014). A cross sectional survey examining the association between therapeutic relationships and service user satisfaction in forensic mental health settings. *BMC research notes*, *7*(1), 657. https://doi.org/10.1186/1756-0500-7-657

Markham, D. (2003). Attitudes towards patients with a diagnosis of 'borderline personality disorder': Social rejection and dangerousness. *Journal of mental health*, *12*(6), 595-612. https://doi.org/10.1080/09638230310001627955

Marshall, J., Freshwater, K., & Potter, S. (2014). Using Cognitive Analytic Therapy within a forensic setting: An overarching relational model. *Forensic Update 2014 Annual Compendium,* 132-137.

Martin, J. A., & Penn, D. L. (2002). Attributional Style in Schizophrenia: An Investigation in Outpatients With and Without Persecutory Delusions. *Schizophrenia Bulletin*, *28*(1), 31–41. https://doi.org/10.1093/oxfordjournals.schbul.a006916

Mason, T., Coyle, D., & Lovell, A. (2008). Forensic psychiatric nursing: skills and competencies: II clinical aspects. *Journal of Psychiatric and Mental Health Nursing*, *15*(2), 131-139. https://doi.org/10.1111/j.1365-2850.2007.01192.x

Mason, T., Hall, R., Caulfied, M., & Melling, K. (2010). Forensic nurses' perceptions of labels of mental illness and personality disorder: clinical versus management issues. *Journal of psychiatric and mental health nursing*, *17*(2), 131-140. https://doi.org/10.1111/j.1365-2850.2009.01483.x

McCann, E., & Bowers, L. (2005). Training in cognitive behavioural interventions on acute psychiatric inpatient wards. *Journal of Psychiatric and Mental Health Nursing*, *12*(2), 215-222. https://doi.org/10.1111/j.1365-2850.2004.00822.x

McCormack, M., Tierney, K., Brennan, D., Lawlor, E., & Clarke, M. (2014). Lack of insight in psychosis: theoretical concepts and clinical aspects. *Behavioural and cognitive psychotherapy*, *42*(3), 327-338. https://doi.org/10.1017/S1352465813000155

McKay, R., Langdon, R., & Coltheart, M. (2005). Paranoia, persecutory delusions and attributional biases. *Psychiatry Research*, *136*(2–3), 233–245. https://doi.org/10.1016/j.psychres.2005.06.004

McLeod, H. J., Deane, F. P., & Hogbin, B. (2002). Changing staff attitudes and empathy for working with people with psychosis. *Behavioural and Cognitive Psychotherapy*, *30*(4), 459-470. https://doi.org/10.1017/S1352465802004071

Mehl, S., Landsberg, M. W., Schmidt, A. C., Cabanis, M., Bechdolf, A., Herrlich, J., … Wagner, M. (2014). Why do bad things happen to me? Attributional style, depressed mood, and persecutory delusions in patients with schizophrenia. *Schizophrenia Bulletin*, *40*(6), 1338–1346. https://doi.org/10.1093/schbul/sbu040

Mehl, S., Rief, W., Lullmann, E., Ziegler, M., Muller, M. J., & Lincoln, T. M. (2010). Implicit attributional style revisited: Evidence for a state-specific "self-decreasing" implicit attributional style in patients with persecutory delusions. *Cognitive Neuropsychiatry*. https://doi.org/10.1080/13546801003640419

Melo, S. S., & Bentall, R. P. (2013). "Poor me" versus "Bad me" paranoia: The association between self-beliefs and the instability of persecutory ideation. *Psychology and Psychotherapy: Theory, Research and Practice*, *86*(2), 146–163. https://doi.org/10.1111/j.2044-8341.2011.02051.x

Melo, S. S., Taylor, J. L., & Bentall, R. P. (2006). " Poor me " versus " bad me " paranoia and the instability of persecutory ideation Copyright © The British Psychological Society. *Psychology and Psychotherapy*, *79*(2), 271–287. https://doi.org/10.1348/147608305X52856

Melzer, D., Tom, B. D., Brugha, T., Fryers, T., Gatward, R., Grounds, A., ... & Meltzer, H. (2004). Access to medium secure psychiatric care in England and Wales. 3: The clinical needs of assessed patients. *Journal of Forensic Psychiatry & Psychology*, *15*(1), 50-65. https://doi.org/10.1080/14789940410001661856

Menon, M., Addington, J., & Remington, G. (2013). Examining cognitive biases in patients with delusions of reference. *European Psychiatry*, *28*(2), 71–73. https://doi.org/10.1016/j.eurpsy.2011.03.005

Mizrahi, R., Addington, J., Remington, G., & Kapur, S. (2008). Attribution style as a factor in psychosis and symptom resolution. *Schizophrenia Research*, *104*(1–3), 220–227. https://doi.org/10.1016/j.schres.2008.05.003

Moher, D., Liberati, A., Tetzlaff, J., Altman, D., & The PRISMA Group. (2009). Preferred Reporting / tems for Systematic Reviews and Meta-Analysis: The PRISMA Statement. *PLoSMed*. https://doi.org/10.1371/journal.pmed1000097

Moritz, S., Woodward, T. S., Burlon, M., Braus, D. F., & Andresen, B. (2007). Attributional style in schizophrenia: Evidence for a decreased sense of self-causation in currently paranoid patients. *Cognitive Therapy and Research*, *31*(3), 371–383. https://doi.org/10.1007/s10608-006-9070-5

Murphy, P., Bentall, R. P., Freeman, D., O'Rourke, S., & Hutton, P. (in preparation). The 'paranoia-as-defence' model of persecutory delusions: A systematic review and meta-analysis.

National Offender Management Service (2015). The offender personality disorder pathway strategy 2015. Accessed May 2018 from: https://www.england.nhs.uk/commissioning/wp-content/uploads/sites/12/2016/02/opd-strategy-nov-15.pdf

Needles, D. J., & Abramson, L. Y. (1990). Positive life events, attributional style, and hopefulness: Testing a model of recovery from depression. *Journal of Abnormal Psychology*, *99*(2), 156. http://psycnet.apa.org/doi/10.1037/0021-843X.99.2.156

Newman, C., Patterson, K., Eason, M., & Short, B. (2016). Defining the role of a forensic hospital registered nurse using the Delphi method. *Journal of nursing management*, *24*(8), 1130-1136. https://doi.org/10.1111/jonm.12422

Niebieszczanski, R. J., Dent, H., & McGowan, A. (2016). 'Your personality is the intervention': a grounded theory of mental health nurses' beliefs about hope and experiences of fostering hope within a secure setting. *The Journal of Forensic Psychiatry & Psychology*, *27*(3), 419-442. https://doi.org/10.1080/14789949.2015.1134626

Paolini, E., Moretti, P., & Compton, M. T. (2016). Delusions in first-episode psychosis: Principal component analysis of twelve types of delusions and demographic and clinical correlates of resulting domains. *Psychiatry research*, *243*, 5-13. https://doi.org/10.1016/j.psychres.2016.06.002

Parkinson, S., Eatough, V., Holmes, J., Stapley, E., & Midgley, N. (2016). Framework analysis: A worked example of a study exploring young people's experiences of depression. *Qualitative research in psychology*, *13*(2), 109-129. https://doi.org/10.1080/14780887.2015.1119228

Peterson, C., Semmel, A., von Baeyer, C., Abramson, L. Y., Metalsky, G. I., & Seligman, M. E. P. (1982). The attributional Style Questionnaire. *Cognitive Therapy and Research*, *6*(3), 287–299. https://doi.org/10.1007/BF01173577

Pickvance, D., Parry, G., & Howe, A. (2004). A cognitive analytic framework for understanding and managing problematic frequent attendance in primary care. *Primary Care Mental Health*, *2*(3), 165-174.

Randall, F., Corcoran, R., Day, J., & Bentall, R. (2003). Attention, theory of mind, and causal attributions in people with persecutory delusions: A preliminary investigation. *Cognitive Neuropsychiatry*, *8*(4), 287–294. https://doi.org/10.1080/135468000057

Randjbar, S., Veckenstedt, R., Vitzthum, F., Hottenrott, B., & Moritz, S. (2011). Attributional biases in paranoid schizophrenia: Further evidence for a decreased sense of self-causation in paranoia. *Psychosis*, *3*(1), 74–85. https://doi.org/10.1080/17522431003717675

Review Manager (RevMan) for Windows. Version 5.3. Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2014.

Ritchie, J., Lewis, J., Nicholls, C. M., & Ormston, R. (Eds.). (2013). *Qualitative research practice: A guide for social science students and researchers*. Sage.

Ross, C. A., & Goldner, E. M. (2009). Stigma, negative attitudes and discrimination towards mental illness within the nursing profession: a review of the literature. *Journal of psychiatric and mental health nursing*, *16*(6), 558-567. https://doi.org/10.1111/j.1365-2850.2009.01399.x

Royal College of Psychiatrists (2015). See, think, act: your guide to relational security. Accessed May 2018 from: https://www.rcpsych.ac.uk/pdf/STA_hndbk_2ndEd_Web_2.pdf

Royal College of Psychiatrists (2016). Standards for forensic mental health services: Low and medium secure care. Accessed May 2018 from: https://www.rcpsych.ac.uk/pdf/QNFMHS_Standards_2016%20(002).pdf

Ryle, A., & Kerr, I. B. (2003). *Introducing cognitive analytic therapy: Principles and practice*. John Wiley & Sons.

Sandhu, D. K., Rose, J., Rostill-Brookes, H. J., & Thrift, S. (2012). 'It's Intense, to an Extent': a qualitative study of the emotional challenges faced by staff working on a treatment programme for intellectually disabled sex offenders. *Journal of Applied Research in Intellectual Disabilities*, *25*(4), 308-318. https://doi.org/10.1111/j.1468-3148.2011.00667.x

Sanford, N., & Woodward, T. S. (2017). Symptom-related attributional biases in schizophrenia and bipolar disorder. *Cognitive neuropsychiatry*, *22*(4), 263-279. https://doi.org/10.1080/13546805.2017.1314957

Serran, G., & Marshall, W. (2010). Therapeutic process in the treatment of sexual offenders: A review article. *The British Journal of Forensic Practice*, *12*(3), 4-16. https://doi.org/10.5042/bjfp.2010.0421

Sharp, H. M., Fear, C. F., & Healy, D. (1997). Attributional style and delusions: An investigation based on delusional content. *European Psychiatry*, *12*(1), 1–7. https://doi.org/10.1016/S0924-9338(97)86371-7

Sherring, S., & Knight, D. (2009). An exploration of burnout among city mental health nurses. *British Journal of Nursing*, *18*(20), 1234-1240. https://doi.org/10.12968/bjon.2009.18.20.45114

Simpson, A. I., & Penney, S. R. (2011). The recovery paradigm in forensic mental health services. *Criminal Behaviour and Mental Health*, *21*(5), 299-306. https://doi.org/10.1002/cbm.823

Slemon, A., Jenkins, E., & Bungay, V. (2017). Safety in psychiatric inpatient care: The impact of risk management culture on mental health nursing practice. *Nursing inquiry*, *24*(4). https://doi.org/10.1111/nin.12199

Srivastava, A., & Thomson, S. B. (2009). Framework analysis: a qualitative methodology for applied policy research. *Journal of Administration and Governance 72.* Accessed May 2018 from: https://ssrn.com/abstract=2760705

Summers, A. (2006). Psychological formulations in psychiatric care: staff views on their impact. *The Psychiatrist*, *30*(9), 341-343. https://doi.org/10.1192/pb.30.9.341

The Association for Cognitive Analytic Therapy (ACAT; 2018). What is Cognitive Analytic Therapy? Accessed May 2018 from: https://www.acat.me.uk/factsheets/What-is-CAT-brief-guide.pdf

The Forensic Matrix (2011). The Forensic Network, NHS Scotland. Accessed May 2018 from: http://www.forensicnetwork.scot.nhs.uk/

Thompson, A. R., Donnison, J., Warnock-Parkes, E., Turpin, G., Turner, J., & Kerr, I. B. (2008). Multidisciplinary community mental health team staff's experience of a 'skills level'training course in cognitive analytic therapy. *International Journal of Mental Health Nursing*, *17*(2), 131-137. https://doi.org/10.1111/j.1447-0349.2008.00521

Tiernan, B., Tracey, R., & Shannon, C. (2014). Paranoia and self-concepts in psychosis: A systematic review of the literature. *Psychiatry Research*. https://doi.org/10.1016/j.psychres.2014.02.003

Totman, J., Hundt, G. L., Wearn, E., Paul, M., & Johnson, S. (2011). Factors affecting staff morale on inpatient mental health wards in England: a qualitative investigation. *BMC psychiatry*, *11*(1), 68. https://doi.org/10.1186/1471-244X-11-68

Trower, P., & Chadwick, P. (1995). Pathways to Defense of the Self: A Theory of Two Types of Paranoia. *Clinical Psychology: Science and Practice*, *2*(3), 263–278. https://doi.org/10.1111/j.1468-2850.1995.tb00044.x

Wallace, B. C., Lajeunesse, M. J., Dietz, G., Dahabreh, I. J., Trikalinos, T. A., Schmid, C. H., … Gurevitch, J. (2017). OpenMEE: Intuitive, open-source software for meta-analysis in ecology and evolutionary biology. *Methods in Ecology and Evolution, 8,* 941-947.

Walsh, S. (1996). Adapting cognitive analytic therapy to make sense of psychologically harmful work environments. *Psychology and Psychotherapy: Theory, Research and Practice*, *69*(1), 3-20. https://doi.org/10.1111/j.2044-8341.1996.tb01846.x

Wilkinson, H., Whittington, R., Perry, L., & Eames, C. (2017). Does Formulation of Service Users' Difficulties Improve Empathy in Forensic Mental Health Services?. *Journal of Forensic Psychology Research and Practice*, *17*(3), 157-178. https://doi.org/10.1080/24732850.2017.1297758

Williams, J. W., Plassman, B. L., Burke, J., Holsinger, T., & Benjamin, S. (2010). Preventing Alzheimer's disease and cognitive decline. *Evidence report/technology assessment*, *193*(1), 1-727. doi:10.1059/0003-4819-153-3-201008030-00258.

Wilson, D. B. (2018). Practical Meta-Analysis Effect Size Calculator. Retrieved from https://www.campbellcollaboration.org/escalc/html/EffectSizeCalculator-Home.php

Wimberley, T., Støvring, H., Sørensen, H. J., Horsdal, H. T., MacCabe, J. H., & Gasse, C. (2016). Predictors of treatment resistance in patients with schizophrenia: a population-based cohort study. *The Lancet Psychiatry*, *3*(4), 358-366. https://doi.org/10.1016/S2215-0366(15)00575-1

Yanchus, N. J., Periard, D., & Osatuke, K. (2017). Further examination of predictors of turnover intention among mental health professionals. *Journal of psychiatric and mental health nursing*, *24*(1), 41-56. https://doi.org/10.1111/jpm.12354